



UNDERSTANDING THE WORKER NEEDS OF MANUFACTURERS:

THE 2011 Minnesota Skills Gap Report

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Introduction

Manufacturing matters in Minnesota. The manufacturing sector accounts for 13 percent of Minnesota jobs in the private sector, and almost 15 percent of gross state output of the private sector. Although the importance of manufacturing to the economy as a whole has declined, productivity growth in manufacturing remains one of the key drivers for economic growth. Between 2001 and 2010, while productivity (output per hour) in nonfarm business grew at an overall rate of 24 percent, it increased by 36 percent in manufacturing. In particular, productivity growth in durable goods industries (35 percent) slightly outpaced productivity growth in non-durable goods industries (31 percent) during this period. In an environment of rapidly changing technology and operations, a high performing workforce capable of performing highly skilled jobs is critical to the future success of this industry sector.

Businesses agree. A survey in 2011 by the Minnesota Department of Employment and Economic Development reveals that a “high-performance workforce” is the number one factor for firm success, according to 67 percent of Minnesota manufacturers. These results are aligned with those from surveys of manufacturing businesses nationwide by the National Association of Manufacturers (NAM), Deloitte and the Manufacturing Institute (MI) initially done in 2005, and repeated by Deloitte and MI in 2011.

Because the workforce environment for manufacturing is changing, both in Minnesota and across the country, several Minnesota partners launched the survey research project to better understand manufacturers’ workforce needs. Partners include:

- Arrowhead Manufacturers and Fabricators Association,
- Central Minnesota Manufacturers Association,
- Highway 2 West Manufacturers’ Association,
- Manufacturers Alliance,
- Minnesota Department of Employment and Economic Development (DEED),
- Minnesota Precision Manufacturing Association (MPMA),
- M-Powered Manufacturing, and
- Tri-State Manufacturers’ Association.

The information on workforce trends and the availability of qualified workers gained from this survey will help the State of Minnesota, local governments, the educational system and other service providers align and prioritize services and support to Minnesota manufacturers. The survey results are presented for businesses statewide, segmented by business size and Minnesota Planning Region, and compared with results from national studies when possible.

In spring of 2011, paper surveys were mailed to a stratified random sample of businesses in four size groups: businesses with 5 to 19 employees (very small), businesses with 20 to 74 employees (small), businesses with 75 to 250 employees (medium), and businesses with more than 250 employees (large). A total of 511 businesses responded, out of 2,400 surveys sent, a response rate of 21.3 percent (23.9 percent when adjusting for non-deliverable addresses and non-useable responses). Overall, the survey has a confidence interval of +/- 4.1 percent, at a level of confidence of 95 percent. However, sub-sample results by region and business size will have larger confidence intervals.

Table 1. Summary of Respondent Characteristics, by Company Size

Company Size	Number of respondents	Respondent Distribution	Original Distribution	Response Rates
Very Small (5-19)	110	22%	31%	15%
Small (20-74)	211	41%	31%	29%
Medium (75-249)	152	30%	29%	21%
Large (250 or more)	38	7%	9%	17%
All Respondents	511	100%	100%	21%

In the overall results, very small businesses (5 to 20 employees) were under-represented and small businesses (20 to 74 employees) were over-represented, meaning that the results may be more representative of businesses with 20 or more employees (small, medium, large).

Table 2. Distribution of Respondents by Region

Company Location (Minnesota Planning Region)	Number of respondents	Respondents	Original Survey Sample [not adjusted for incorrect addresses]
Central	82	16%	14%
Northeast	32	6%	5%
Northwest	56	11%	9%
Southeast	67	13%	11%
Southwest	49	10%	8%
Twin Cities	225	44%	54%
	511	100%	100%

In the overall results, Twin Cities businesses had a relatively lower response rate than other regions, compared with the original survey sample that was stratified by size but not by region. However, the number of responding businesses located in the Twin Cities metropolitan region vastly outnumbers respondents from any other region.

Additional detail on survey methodology is included at the end of this report. A copy of the survey instrument and detailed survey results (segmented by business size and by region) are available online at www.PositivelyMinnesota.com.

Insights from Survey Results

A high-performing workforce is critical to the success of manufacturing businesses in Minnesota. In fact, a high performing workforce was the number one factor for future business success over the next three years, according to 67 percent of respondents. New product innovation (46 percent) and low-cost producer status (41 percent) were the next highest rated success factors for manufacturers. In this environment, maintaining an adequate supply of workers with appropriate skills is critical.

The importance of a high-performance workforce and new product innovation increased as companies employed more employees. For example, 82 percent of large companies selected high-performance workforce among their top three factors for business success, compared with 74 percent of medium companies, 70 percent of small companies and 49 percent of very small companies. Similarly, 63 percent of large companies highly valued new product innovation, exceeding the shares of companies other sizes selecting this factor: 55 percent of medium, 42 percent of small and 36 percent of very small companies. The third factor, low-cost producer status, was valued by about the same proportion (39 percent to 44 percent) of companies in each size group.

Large, medium and small responding companies ranked these three top factors in this same order as the overall average. However, very small companies valued low-cost producer status (44 percent) ahead of new product innovation (36 percent) as factors important to business success.

Figure 1. Factors for Business Success, by Company Size

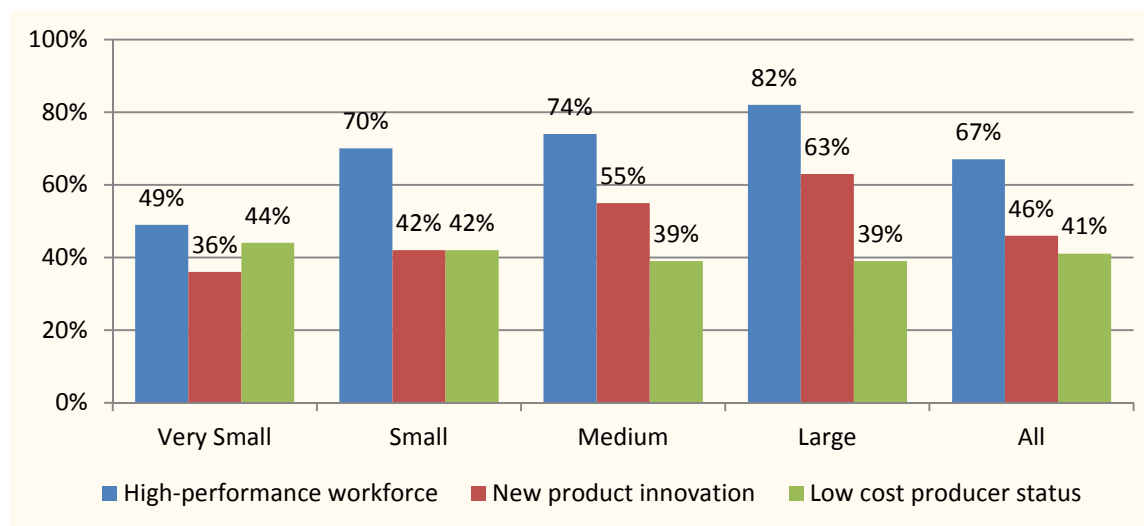
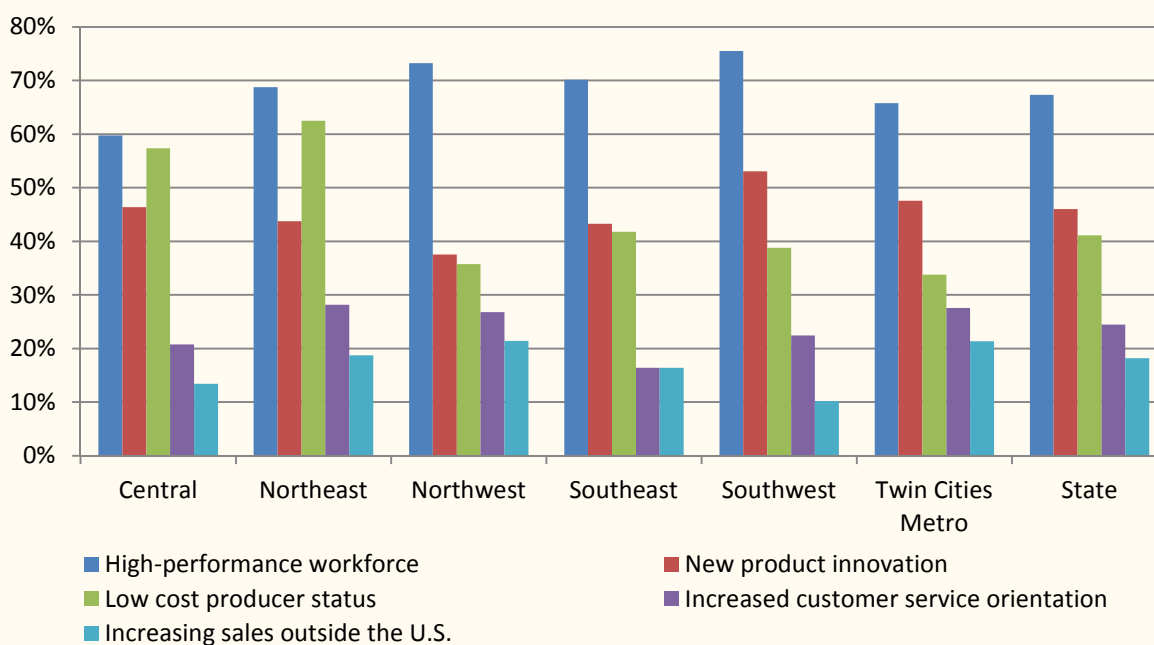


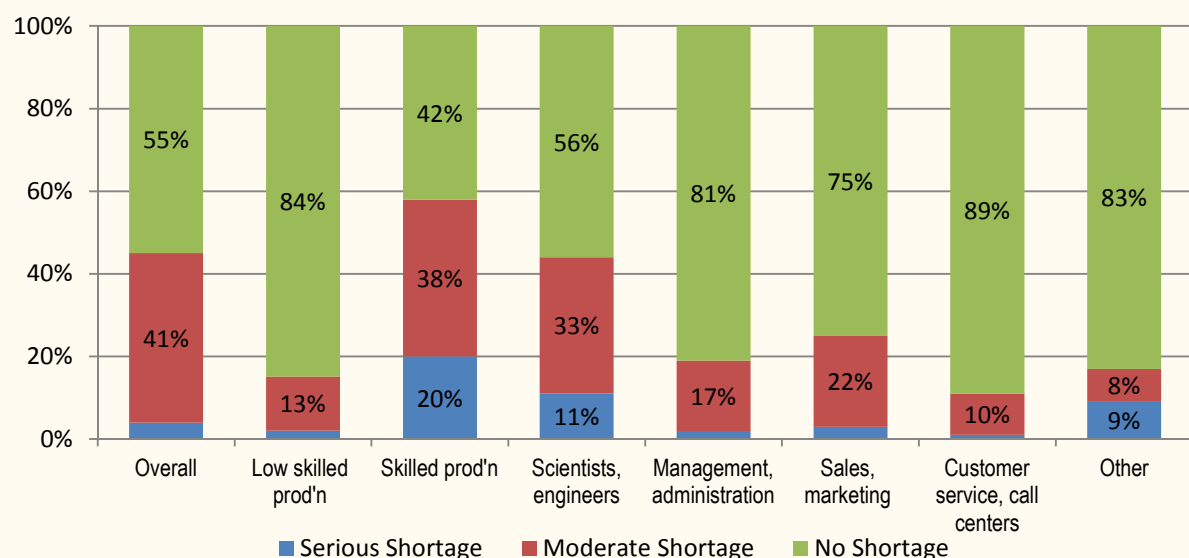
Figure 2. Factors for Business Success, by Minnesota Region

Workforce Shortages

Workforce shortages are a potential cause for concern for Minnesota businesses. Close to half of respondents (47 percent) had positions that were unfilled due to lack of qualified applicants, including 13 percent with 10 percent or more of jobs unfilled.

Respondents were asked to rate the severity of any current shortage for selected occupational groups (on the scale of serious, moderate or no shortage). Overall, 45 percent of respondents indicated moderate or serious shortage. The current shortage appeared most severe in skilled production, where 58 percent of respondents indicated moderate or serious shortage. No other occupational group reached 45 percent for moderate or serious shortages. The current shortage appeared less severe for low-skilled production (16 percent), management and administration (18 percent), and customer service (11 percent). See Figure 3 for full results on current shortages.

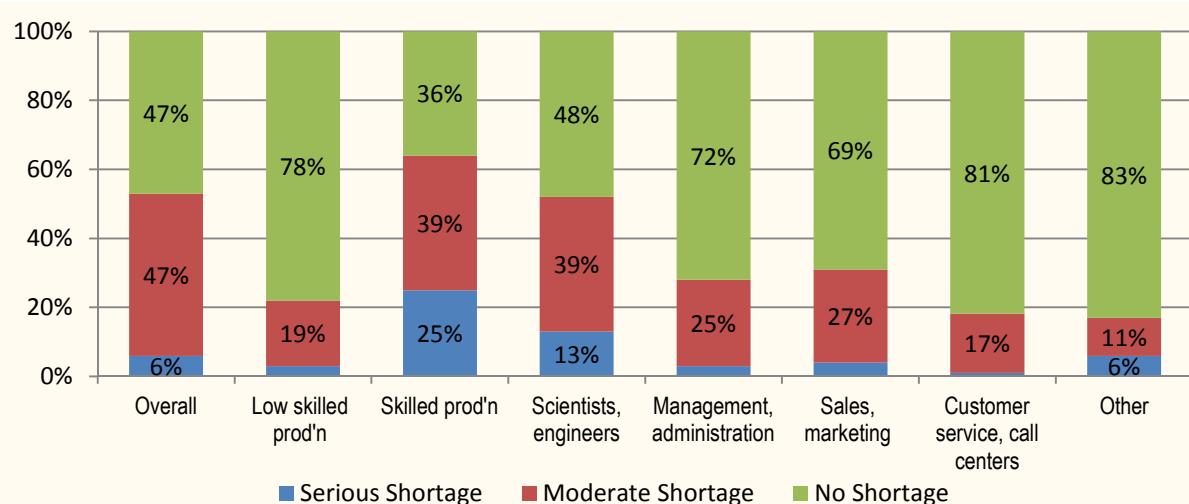
Figure 3. Current Workforce Shortages by Occupational Group



Source: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," Minnesota Department of Employment and Economic Development, 2011.

Respondents expected the severity of the shortage in the overall workforce to increase three years from now, with 53 percent of respondents (up by 8 percentage points compared to the current shortage) predicting a moderate or serious shortage. By occupational group, the shortage will continue to be most severe in skilled production, where 64 percent of respondents predicted moderate or serious shortages. Shortages were also expected to increase for scientists and engineers (52 percent). Relative to other occupational groups, the shortage was expected to remain low for low-skilled production (22 percent), management and administration (28 percent), and customer service (19 percent). See Figure 4 for full results of expected shortages in three years.

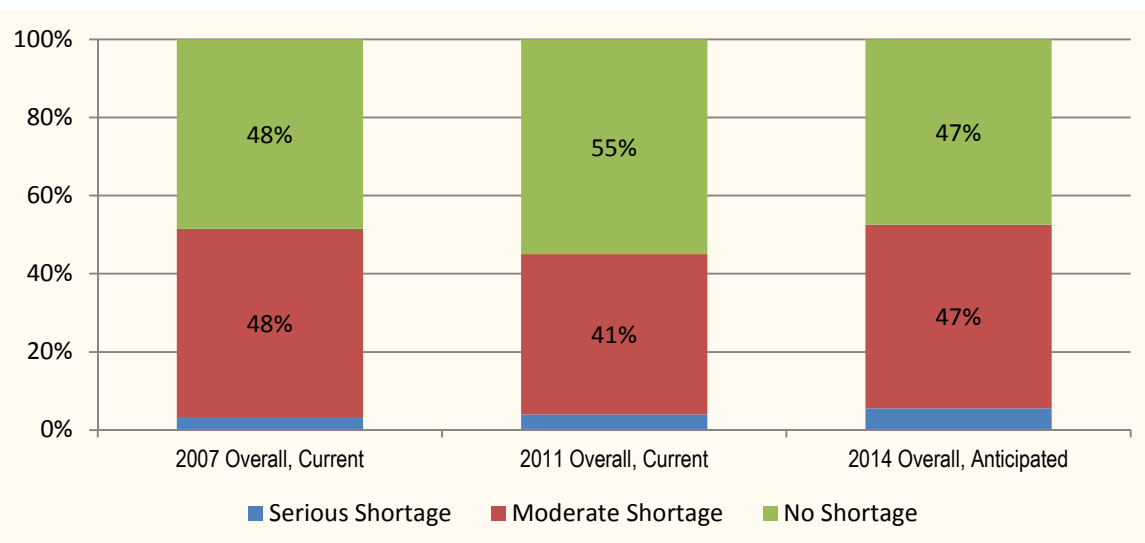
Figure 4. Workforce Shortages in Three to Five Years, by Occupational Group



Source: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," Minnesota Department of Employment and Economic Development, 2011.

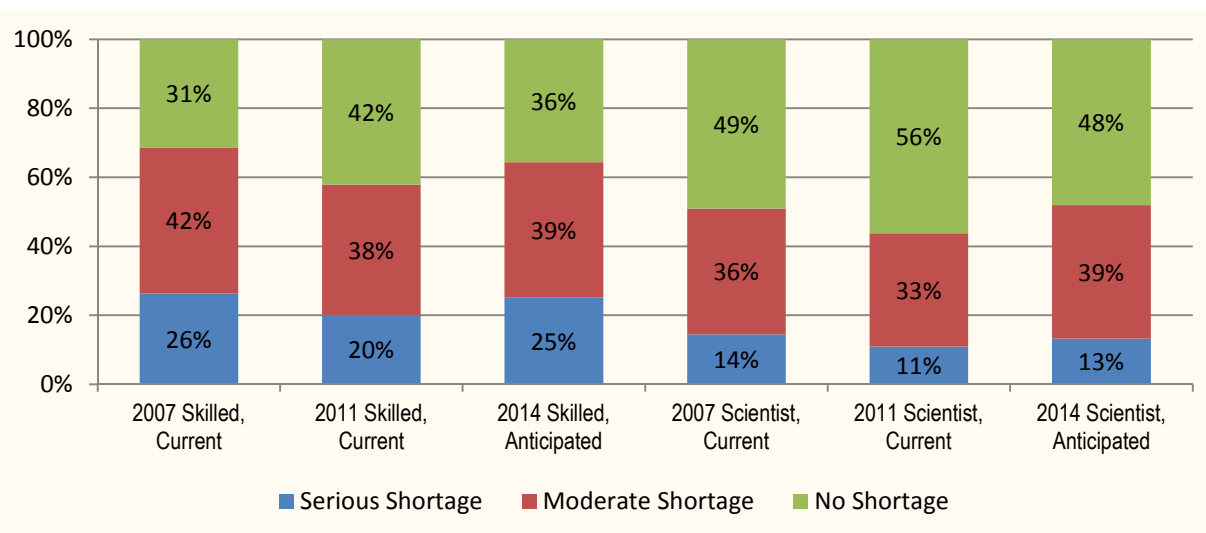
Compared with the 2007 survey results, a larger share of respondents (by 7 percentage points) faced no current workforce shortage and a smaller share of respondents (by 7 percentage points) faced a moderate shortage in 2011. However, in three years, respondents anticipated a return to similar workforce shortages that were reported in 2007, with a slight increase in the share of those expecting a serious shortage.

Figure 5. Current and Anticipated Overall Workforce Shortages, 2007 vs. 2011



There were similar trends in the two occupational areas where the shortages were the most severe, skilled production and scientists and engineers. While there were improvements in workforce availability between 2007 and 2011, shortages are expected to increase in 2014 and return to levels more similar to 2007.

Figure 6. Current and Anticipated Workforce Shortages for Selected Occupational Areas, 2007 vs. 2011



Note: "2007 Current" data were reported in "Understanding the Worker Needs of Manufacturers: The 2007 Skills Gap Survey." "2011 Current" and "2014 Anticipated" are reported in Understanding the Worker Needs of Manufacturers: The 2011 Skills Gap Survey." Both surveys were conducted by the Minnesota Department of Employment and Economic Development.

The impact of workforce shortages was reported in several different ways, with the primary impact on a company's ability to maintain production levels consistent with customer demand (37 percent of respondents). Other frequently cited impacts included achieving productivity targets (23 percent), implementing quality improvement processes (22 percent), new product development and innovation (19 percent) and implementing new technology (19 percent). However, a large share of respondents indicated that their company had experienced no impact from workforce shortages (31 percent).

There was some regional variation on the impacts of workforce shortages. The Twin Cities Metro mirrored the statewide results in rankings of the impacts. Workforce shortages had above average impacts on achieving and maintaining target levels of customer service and satisfaction, and maintaining production levels consistent with customer demand in the Northwest. However, implementing quality improvement processes was relatively less important in the Northwest (ranked sixth, compared with third statewide).

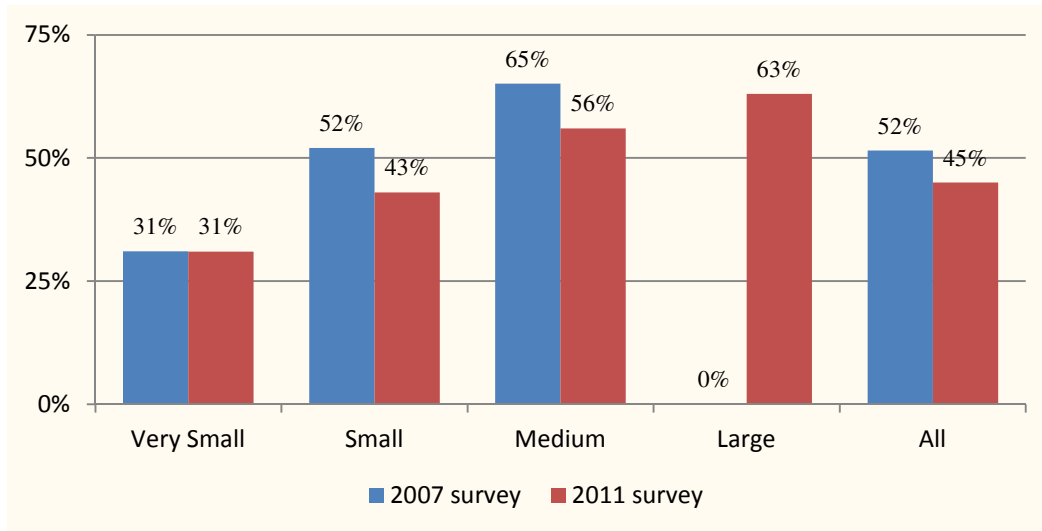
Achieving and maintaining target levels of customer service and satisfaction was relatively more critical for the Southwest, ranking third among areas impacted by workforce shortages, compared with seventh statewide. On the other hand, new product development and innovation was less affected and ranked sixth in the Southwest, compared with fourth statewide.

Workforce Shortages: By Company Size

Workforce shortages have a larger impact on large- and medium-sized companies. Survey results show a distinct pattern among the size groups in questions related to current and future workforce shortages.

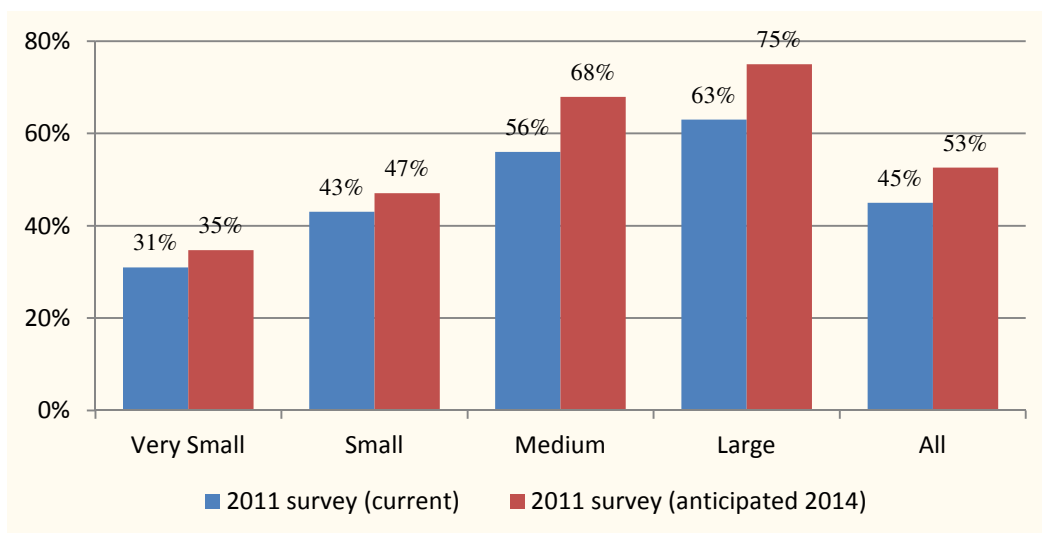
In general, workforce shortages were most pronounced for large (250 employees or more) and medium (between 75 and 249 employees) companies and least pronounced for very small companies, while small companies tended to be closer to the overall average. For example, 71 percent of very small companies indicated that no jobs were unfilled due to a lack of qualified applicants, compared with 36 percent for large companies, 44 percent for medium companies, 53 percent for small companies and 53 percent overall.

Nearly all occupational groups followed a similar pattern in which large and medium companies were more affected by current overall shortages than very small companies. More than half of large companies (63 percent) and medium companies (56 percent) had a moderate or serious shortage in the overall workforce, compared with 43 percent of small companies and 31 percent of very small companies. A medium or serious shortage in the overall workforce affected a smaller share of medium and small companies in 2011 than in 2007. However, the share of affected very small companies remained the same. See Figure 7 for results.

Figure 7. Overall Current Moderate and Serious Workforce Shortages by Business Size

Note: The 2007 survey did not include businesses with more than 250 employees.

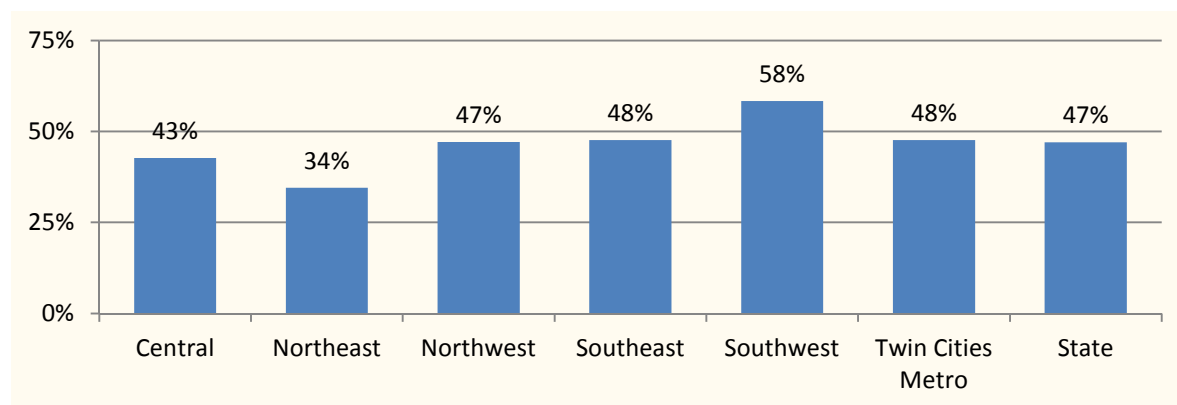
Results for expected shortages in three years follow this pattern. For the overall occupational group, responding large (75 percent) and medium (68 percent) expected to face more serious shortages (moderate or serious) compared with small companies (47 percent) and very small (35 percent) companies. By extension, very small companies (65 percent) were much more likely to expect no shortage, compared with large (25 percent) and medium (32 percent) companies.

Figure 8. Overall Anticipated Moderate and Serious Workforce Shortages by Business Size

Workforce Shortages: By Region

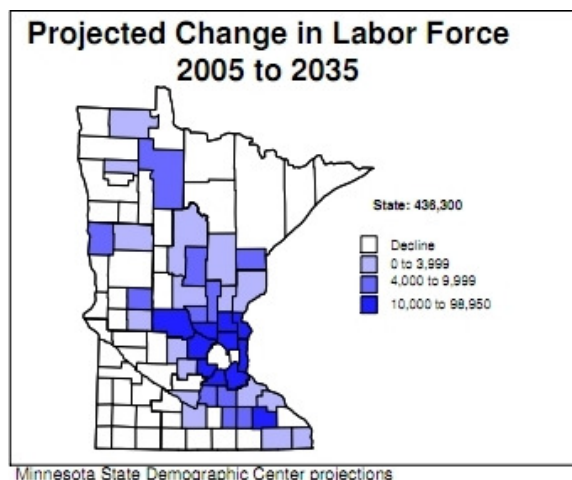
Job vacancies resulting from a lack of qualified applicants appear to be affecting the Southwest region the most, with more than half (58 percent) of respondents reporting job vacancies. In contrast, the Northeast region appeared to be the least affected with about one third (34 percent) reporting that jobs were unfilled due to a lack of qualified applicants. The other regions were within 4 percentage points of the statewide average of 47 percent. See Figure 9. for more detail.

Figure 9. Percentage of Respondents with Vacancies Due to Lack of Qualified Applicants



It is noteworthy to consider labor force projections for the period from 2005 to 2035 made by the Minnesota State Demographic Center in 2008. In particular, the projections show that the labor force in many counties in the Northeast and Southwest regions are expected to decline, while counties in Central, Southeast and the Twin Cities metro (except for Hennepin and Ramsey Counties) are expected to grow. Those in Northwest will have vary.

A more detailed examination of the projected labor force trends between 2010 and 2015 by the State Office of the Demographer shows that most regions will experience mild to moderate labor force growth. The Central region will have the strongest growth (up 10 percent). However, the Northeast region will decline slightly (down 1 percent). Except for in the Central region, these projected trends may contribute to further shortages. See Figure 10 for more details.

Figure 10 and Table 3. Projected Labor Force Trends, 2010-2015 by Region

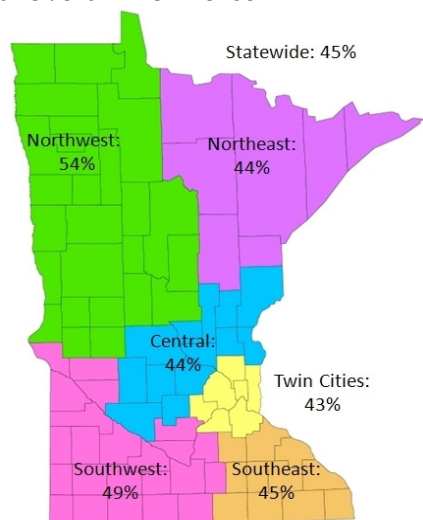
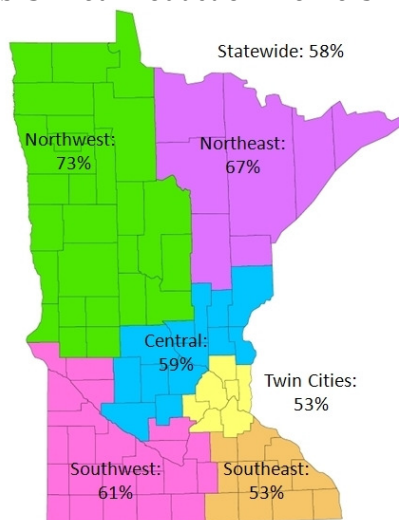
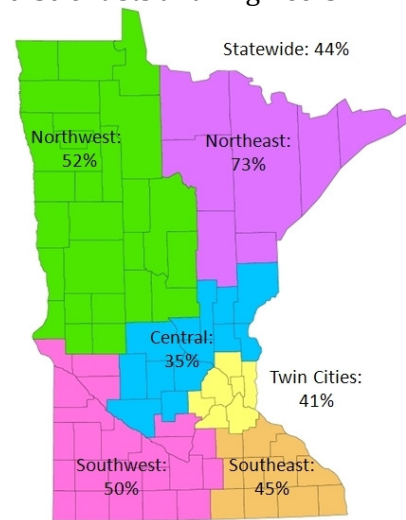
Region	2015 Projected Labor Force	Projected Percent Change, 2010-2015
Central	467,530	10%
Northeast	166,700	-1%
Northwest	307,280	3%
Southeast	301,200	4%
Southwest	224,380	1%
Twin Cities	1,742,210	3%
State	3,209,300	4%

Note: Both 2010 and 2015 are projected labor force data.

Source: Population, household and labor force projections, 2005-2035. Office of the State Demographer, and Office of Geographic and Demographic Analysis, Minnesota Department of Administration, 2008.

Southwest and Northwest were most impacted by overall workforce shortages; they were the only two regions with a moderate or serious shortage of qualified applicants that exceeded the statewide average share of 45 percent of respondents. More than half of respondents in the Northwest (54 percent) faced moderate or serious shortages, while about half those in the Southwest (49 percent) did. These shares were lower for most regions in 2011 than reported in the 2007 survey (but were the same in both years for Northeast) indicating some improvement in workforce availability. See Figure 11 for more detail.

Further, in 2011, Northwest respondents (10 percent) and Southwest respondents (5 percent) were the only regions to face serious overall workforce shortages to a greater degree than the state average of 4 percent.

Figure 11. Percentage of Respondents Indicating Some Degree of Shortages, for Selected Occupational Groups, by Region**a. Overall Workforce****b. Skilled Production Workers****c. Scientists and Engineers**

The most severe shortages across the Southwest, Northwest and Northeast regions were for skilled production workers and scientists and engineers. While shortages for low skilled workers across these three regions were not as severe (23 percent to 25 percent of respondents), they still exceeded the statewide averages.

In Southwest, the largest share of respondents indicating some degree (serious or moderate) of current workforce shortages were for skilled production (61 percent) and scientists and engineers (50 percent), which exceeded statewide averages. Shortages in the Southwest for additional occupational groups such as management and administration, low skilled production and customer service also exceeded statewide averages.

Northwest respondents experienced the largest shortage rates for skilled production (73 percent – the highest rate among all regions) and scientists and engineers (50 percent), followed by low skilled production (25 percent), with all these rates also exceeding the statewide averages.

Northeast respondents reported larger than average shortages of scientists and engineers (73 percent – the highest rate among all regions) and skilled production (67 percent). Respondents in the Northeast also had higher than average reported shortages of low skilled production and management and administration.

Responses for workforce shortages three years from now follow similar patterns. Respondents in Southwest and Northwest expect larger than average shortages overall and many occupational groups. While respondents in the Northeast expect some larger shortages than currently, their shortages by occupational groups are similar to the anticipated statewide averages that reflect increased shares of respondents facing shortages across all occupational groups.

It is important to gain some insights on regional workforce shortages. Average wage data shows that the Northwest and Southwest regions pay the lowest average weekly wages (\$781 per week) in manufacturing industries. Skilled workers are able to choose where to work, whether within Minnesota or even nationally and globally. Lower than average wages make it difficult to attract and retain an effective manufacturing workforce. See Table 4 for more information.

Table 4. Average Weekly Wage in Manufacturing, by Region, 2010

Region	Average Weekly Wage
Minnesota	\$1,082
Central	\$861
Northeast	\$984
Northwest	\$781
Southeast	\$994
Southwest	\$781
Twin Cities	\$1,261

Source: Quarterly Census of Employment and Wages (QCEW), Minnesota Department of Employment and Economic Development.

DEED's Job Vacancy Survey provides additional perspective on the many facets of workforce shortages. In the fourth quarter of 2010, the statewide average job vacancy rate in manufacturing was 1.2 percent. Regional job vacancy rates were highest in Southwest (1.4 percent), followed by the Twin Cities (1.3 percent) – the only regions with above average vacancies. Although the Twin Cities had the highest median wage for job vacancies, the Southwest had the lowest median wage for job vacancies. Because job vacancies may result from vibrant growth creating new positions or from workforce shortages, it is difficult to explain the relationship between job vacancies and workforce shortages, or a combination of both factors. See Table 5 for more information.

Table 5. Job Vacancy Rates and Median Wages of Vacancies, by Region, Fourth Quarter, 2010

Region	Manufacturing Job Vacancy Rate	Median Wage of Vacancies
Minnesota	1.2%	\$15.00
Central Minnesota	0.9%	\$16.83
Northeast Minnesota	1.0%	\$14.73
Northwest Minnesota	1.0%	\$13.00
Southeast Minnesota	0.8%	\$13.50
Southwest Minnesota	1.4%	\$12.00
Twin Cities	1.3%	\$18.27

Source: Job Vacancy Survey, Minnesota Department of Employment and Economic Development.

Worker Recruitment and Retention Tactics and Practices

Businesses use a variety of tools to respond to workforce shortages. Considering the challenge of attracting and retaining employees with the right skills, by far the most common tactic has been retaining current employees (76 percent of respondents). Other commonly used practices included temporary or contract work arrangements (33 percent) and special tactics to hire younger workers (18 percent), followed by delaying retirement for current employees (11 percent) and special tactics to hire older and experienced workers (11 percent). About 14 percent of respondents did not face any challenges related to attracting or retaining employees.

Respondents were asked about the practices that were most successful at retaining current employees and recruiting new employees. Table 3 shows the top practices for retention and recruitment, as reported by more than 10 percent of respondents. The following four practices were the most successful for both retaining current employees and attracting new employees (in decreasing order): health care benefits, increased wages, 401(k) and other retirement plan benefits, and flexible work arrangements. Another successful practice for retaining employees was improving organizational culture; this was less critical in recruiting employees.

Comparing results with those from the 2007 survey, these four top practices appear to be effective for a larger share of firms retaining new employees, but for a smaller share of firms recruiting current employees, in 2011 than in 2007. See Figures 12 and 13 for more detail.

Figure 12. Most Successful Practices to Recruit Employees, 2007 survey vs. 2011 survey

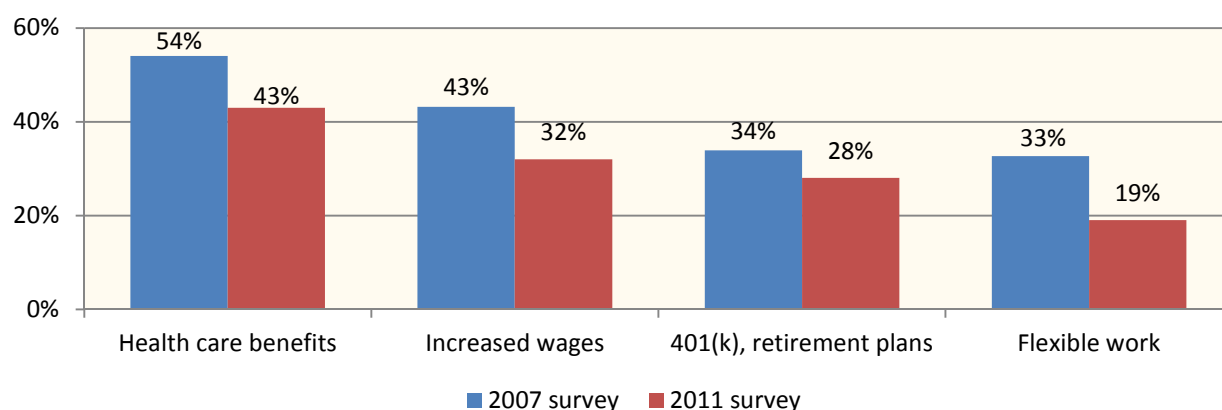
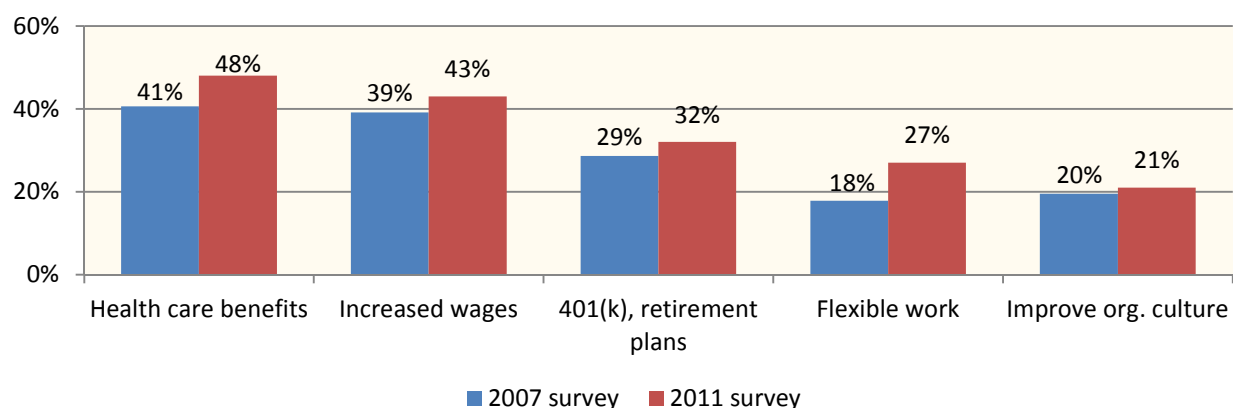


Figure 13. Most Successful Practices to Retain Employees, 2007 survey vs. 2011 survey



Source: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," survey results, Minnesota Department of Employment and Economic Development, 2011.

Retention and Recruitment: by Company Size

Business responses to workforce issues varied, with very small companies on the opposite side of the average compared with large and medium companies. The top three practices for retaining workers were health care benefits, increased wages and retirement benefits/pension plans for all companies, regardless of size (although for very small companies, increased wages surpassed health care benefits in importance).

Small companies tended to be similar to average. Very small companies were much more likely (45 percent of very small respondents) to offer flexible work arrangements as a strategy to retain workers, compared with companies of other sizes (13 percent to 27 percent).

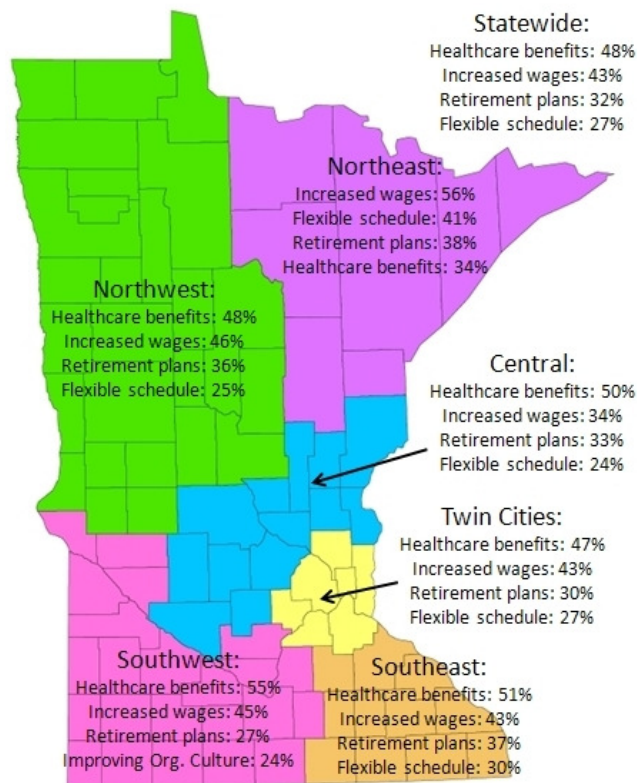
Large (26 percent) and medium (25 percent) companies put relatively more emphasis on improving organizational culture to retain workers, compared with companies of other sizes (15 percent to 20 percent). A much larger share of large companies (24 percent) also used professional development and training as incentives to retain workers, compared with companies of other sizes (6 percent to 12 percent).

Retention and Recruitment: by Region

Regions used similar practices to retain and recruit workers but with slightly differing degrees of usage. Most regions – except Northeast and Southwest to a degree – had the same rankings for the top four overall worker retention practices: health care benefits, increased wages, retirement plans, followed by flexible work schedules. Respondents in Northeast had a stronger reliance on increased wages, flexible work schedules and 401(k) benefits and other retirement plans to retain workers than in other regions, where health care benefits ranked fourth (compared with first for other regions). Respondents in Central, Southeast and Southwest relied on health care benefits to retain workers to a greater degree than respondents in other regions.

Improving organizational culture – typically ranked fifth in importance for most regions – was relatively important for Southwest respondents (24 percent, fourth-ranked, ahead of flexible work arrangements). Professional training and development was more important for respondents in the Northwest (20 percent, ranking fifth, tied with organizational culture) than those statewide (9 percent).

Figure 14. Top Four Worker Retention Practices, Percentage of Respondents By Region



The most commonly used tools for worker retention were also those most commonly used for recruitment of new employees, but to a lesser degree. Respondents in the Southwest (14 percent) and Northwest (13 percent) regions were more likely to rely on incentives for employee referrals for recruitment than other regions.

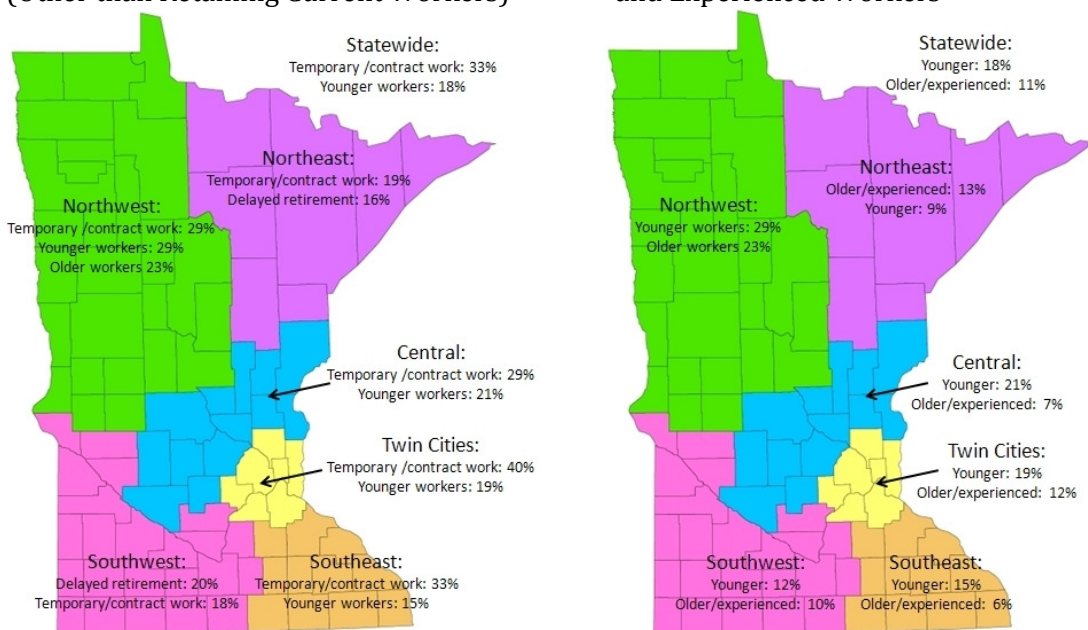
Retention of current workers was the primary tactic respondents will use to address the challenge of attracting and retaining employees over the next three years. Otherwise, for many regions, the main two additional tactics will be temporary or contract work, followed by recruiting younger workers. The exceptions were Northeast and Southwest, where the main two additional tactics will be delaying retirement of current employees and temporary or contract work. Northeast was the only region where a greater share of respondents will use recruiting older workers than recruiting younger workers over the next three years.

Compared with statewide averages, respondents in Northwest will look to a greater degree toward hiring younger workers (29 percent, vs. 18 percent statewide) and older and experienced workers (23 percent vs. 11 percent statewide). Twin Cities respondents (40 percent vs. 33 percent statewide) will more commonly focus on temporary or contract work arrangements. Southwest and Northeast respondents will be more likely to delay retirement (20 percent in Southwest and 16 percent in Northeast, vs. 11 percent statewide). Northeast respondents were more likely to report they needed no special tactics to attract and retain employees (25 percent vs. 14 percent statewide) compared with other regions.

Other groups of workers may be targeted as additional sources of workers. Respondents from Northwest (7 percent) will have increased reliance on foreign nationals or legal immigrants to a slightly greater degree than the statewide average (5 percent), while Southwest (6 percent) and Northeast (6 percent) will attempt to recruit former employees to a greater extent (3 percent statewide). Northeast respondents (6 percent) will also attempt to recruit non-traditional workers (for example, stay-at-home parents, homemakers, retired workers, students, people with disabilities, etc.) to a greater degree than respondents statewide (3 percent).

Figure 15. Tactics that Will Be Used Over the Next Three Years to Recruit and Retain Workers, by Region

- a. Top Tactics to Recruit and Retain Workers (Other than Retaining Current Workers) b. Recruiting Younger Workers vs. Older and Experienced Workers



Placement Services

Placement services play a key role in helping businesses recruit and hire new employees. Respondents were asked whether they used a variety of placement services, and if used, how useful the services were. By far the most used source of placement services was newspapers and other periodic publications, according to 63 percent of respondents. Among respondents who used newspapers and other periodicals, 49 percent rated them in the top half of a four-point scale for usefulness. (The scale from 1 to 4, was defined as 1 means Not Useful to 4 means Very Useful.)

Private employment and recruiting agencies (56 percent usage rate, 65 percent rating in the top half of the usefulness scale) and Internet-based agencies and job boards (55 percent usage rate, 60 percent rating in the top half of the usefulness scale) were also frequently used and highly rated.

About half of respondents used community or technical colleges and public and government agencies (48 percent and 49 percent, respectively) and rated them moderately for usefulness (41 percent and 49 percent, respectively). Overall, large numbers of respondents have not used community- and faith-based organizations and job fairs.

Table 6. Placement Services Used To Recruit and Hire Employees: Usage Rates and Usefulness Ratings

Type of Placement Service	Usefulness Ratings: Percentage of Respondents in the Top Half of the Scale	Usage Rate
Newspapers, other periodic publications	49%	63%
Private employment and recruiting agencies	65%	56%
Internet-based agencies and job boards	60%	55%
Public/government agencies (e.g. DEED WorkForce Centers, Minnesota Job Bank)	49%	49%
Community or technical colleges	41%	48%
Job Fairs	25%	28%
Community-based organizations	23%	22%
Faith-based organizations	17%	11%
Other	79%	9%

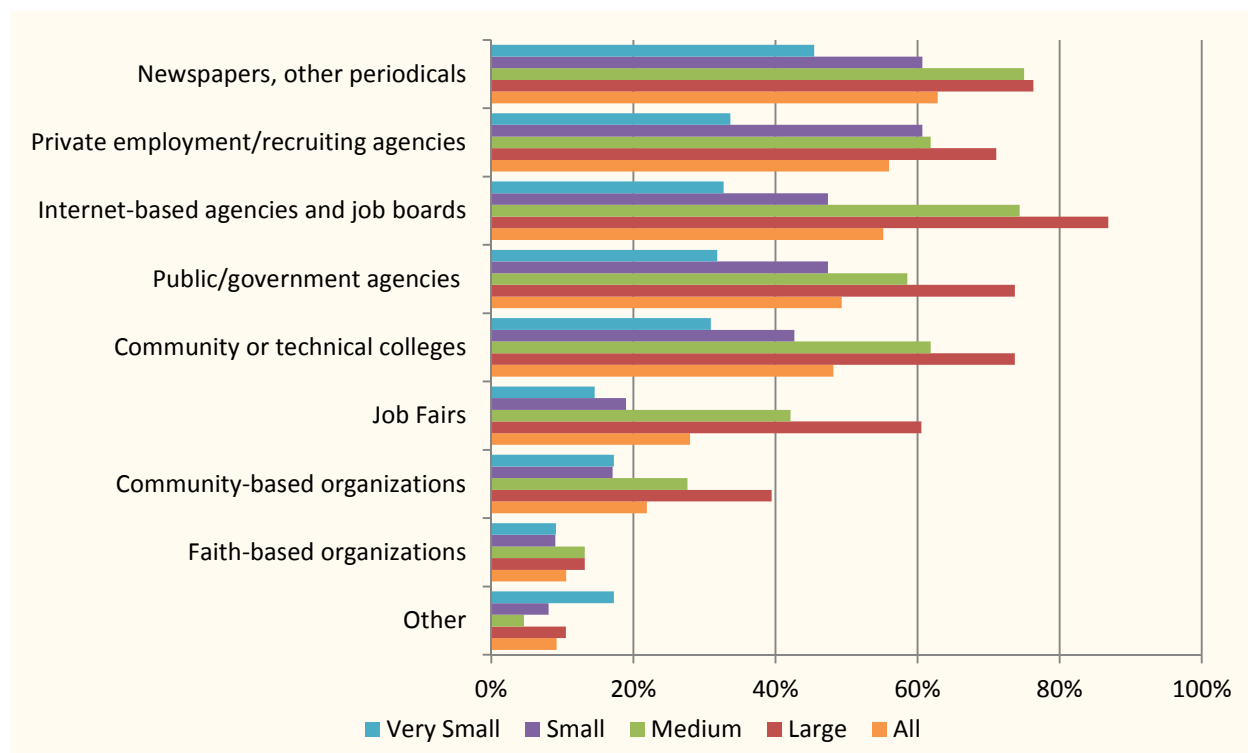
*Usage rate was defined as number of respondents who rated usefulness out of total respondents. The four-point scale for usefulness was from 1 to 4, where 1 means Not Useful to 4 means Very Useful.

Source: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," survey results, Minnesota Department of Employment and Economic Development, 2011.

Placement Services: by Company Size

In terms of strategies used to recruit workers, large and medium companies more intensively used an array of tools – including public and government agencies, community and technical colleges, private employment agencies, community organizations and job fairs – than did small and very small companies. See Figure 16. for more information.

Figure 16. Placement Services Used to Recruit Workers, by Company Size



Usefulness of placement services did not appear to substantially differ by company size. Private employment agencies and public and government agencies were somewhat less useful to large companies than companies of other sizes. Internet based agencies and job boards were somewhat more useful to medium and large companies than small and very small companies.

Placement Services: by Region

Regions used different types of placement services and with varying degrees of intensity. Respondents in all regions relied heavily on newspapers and similar periodicals. Regions other than the Twin Cities relied heavily on public and government agencies, while the Twin Cities and Southwest relied the most on internet job agencies and job boards. Respondents from Northwest and Southwest relied to a greater degree on community and technical colleges' placement services, while the other regions relied more on private employment agencies.

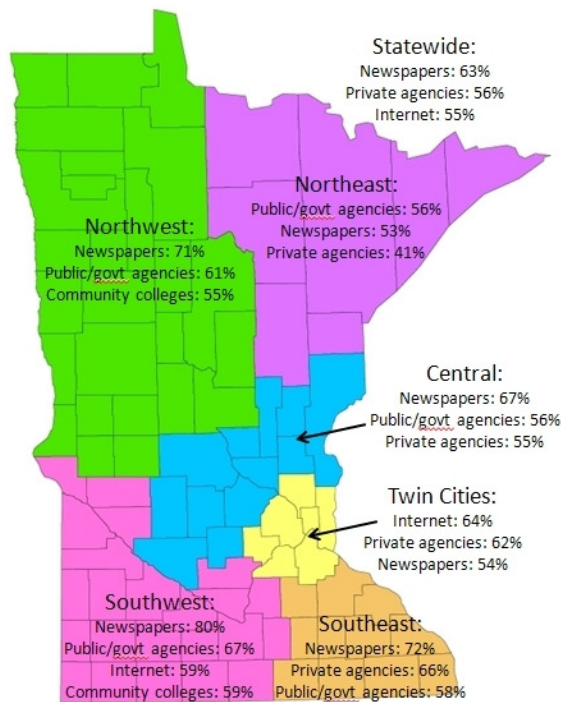
Public and government agencies' placement services were used by at least half of respondents in all regions except for the Twin Cities (36 percent); respondents in the Southwest (67 percent) used these services the most. In particular, these services were relatively more useful to respondents in Northeast (78 percent in the top half of the scale for usefulness), Central (61 percent) and Southwest (61 percent) than respondents statewide (49 percent).

Newspapers and other periodic publications were used more extensively in Northwest, Southwest and Southeast. Larger proportions of respondents from Northeast (65 percent) and Northwest (60 percent) rated these services in the top half of the usefulness scale than from other regions or statewide (49 percent).

Placement services at community and technical colleges were used to a greater degree in Southwest (59 percent) and Northwest (55 percent) but to a much lesser degree in Northeast (25 percent). More than half of respondents in Northwest and Northeast felt that these services were in the top half of the usefulness scale compared with respondents statewide (41 percent).

Internet agencies and job boards were used the least in Northeast (25 percent), although they were used by about half or more respondents in other regions. At least half of respondents in each region rated Internet placement services in the top half of the usefulness scale. A larger share of respondents in Northeast (45 percent vs. 28 percent statewide) relied on job fairs, although generally across all regions, one third or less of respondents rated job fairs in the top half of the usefulness scale.

Figure 17. Top Three Placement Services Used by Respondents, by Region



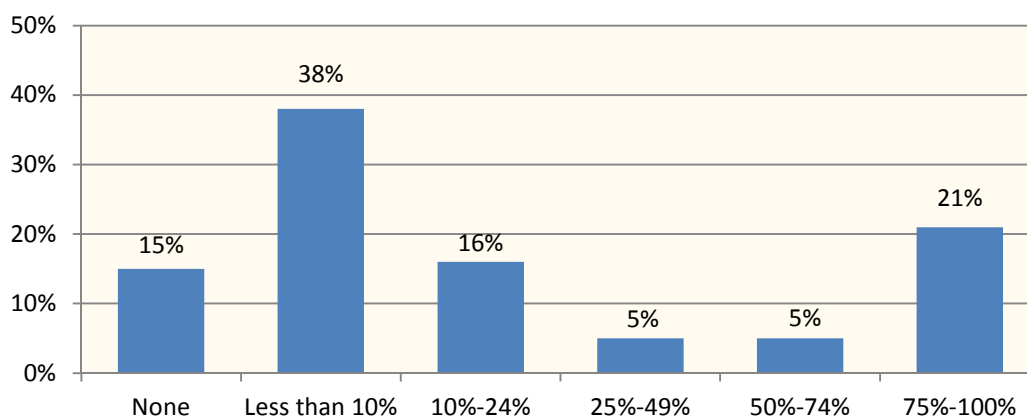
Training Resources

Training is a key response for dealing with workforce shortages and skills gaps. Survey respondents were asked a variety of questions related to training. The majority of respondents (74 percent) had training budgets of less than 3 percent of payroll. Investing at least 3 percent of payroll in employee training is one of the 15 best practices of small and medium-sized manufacturers, according to “The Future Success of Small and Medium Manufacturers: Challenges and Policy Issues,” by RSM McGladrey and The Manufacturing Institute.

Almost two-thirds of respondents either maintained (36 percent) or increased (28 percent) their training budget compared with three years ago.

Companies varied widely on their approaches to company-paid formal training. Slightly more than one-half (54 percent) of responding employers provided company-paid training to less than one quarter of employees, with the bulk of these providing training to less than 10 percent of employees. Small clusters of respondents were also at the two extremes of the spectrum: while 15 percent of employers provided no company-paid training to employees, 21 percent of employers provided company-paid training to 75 to 100 percent of their employees. See Figure 18 for more information.

Figure 18. Percentage of Employees Receiving Company-Paid Formal Training



Source: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," survey results, Minnesota Department of Employment and Economic Development, 2011.

Businesses were asked to select up to three most effective sources of education and training. Employers indicated that they were most likely to turn to community and technical colleges (61 percent), business and industry associations (37 percent), consultants and external training companies (25 percent) and universities (22 percent).

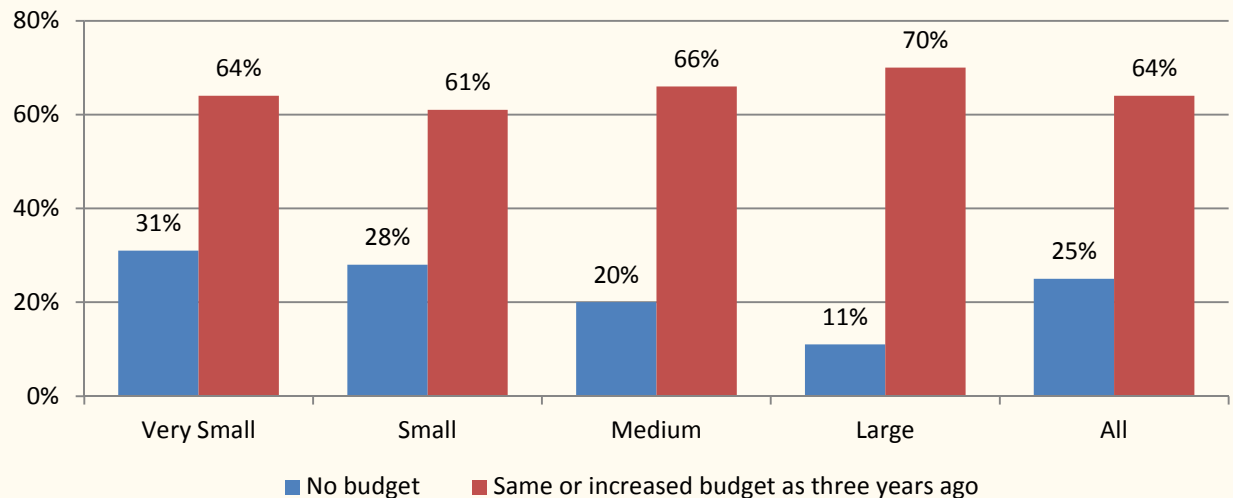
Respondents rated the usefulness of community and technical colleges for training students in skills for business needs, and for training or upgrading skills of current workers. Respondents ranked colleges higher for training students in skills for business needs (with 70 percent in the top half of the four-point usefulness scale) than for training or upgrading skills of current workers (49 percent in the top half).

Training Resources: by Company Size

Large and medium companies had substantially greater resources for training than very small companies. Slightly larger shares of medium and large businesses (24 percent to 26 percent) spent at least 3.0 percent of payroll on employee training than small and very small companies (17 percent to 22 percent), according to survey respondents.

Smaller percentages of large (11 percent) and medium (20 percent) companies had no training budget, compared with small (28 percent) and very small (31 percent) companies. However, the share of companies whose training budgets remained the same or increased compared with three years ago was only slightly higher for large and medium companies (66 percent to 70 percent) than for small and very small companies (61 percent to 64 percent).

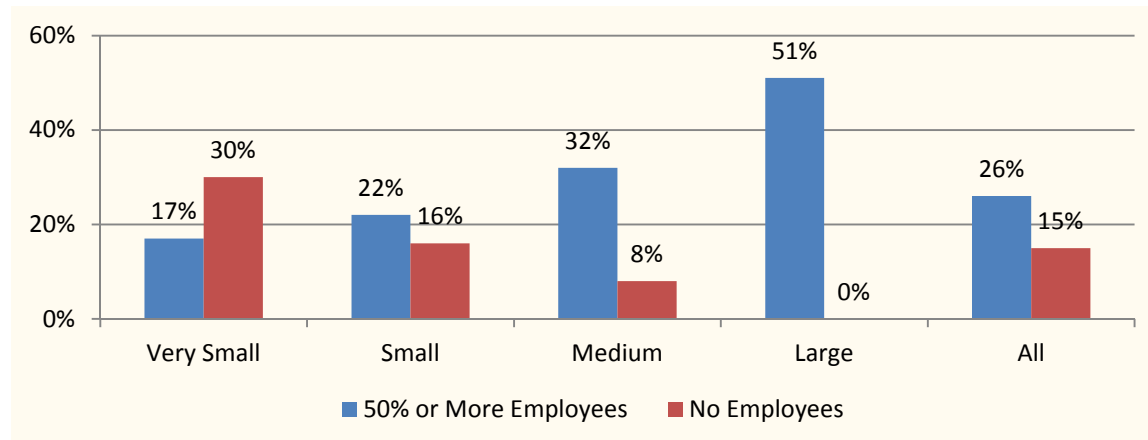
Figure 19. Change in Training Budgets Compared with Three Years Ago



Slightly more than half of responding large companies provided company-paid training to 50 percent or more of their employees annually (with the majority of respondents falling within the range of 75 percent or more of employees receiving training) – compared with 32 percent of medium companies, 22 percent of small companies and 17 percent of small companies.

In contrast, 30 percent of very small companies provided no company-paid formal training to employees each year, compared with 16 percent of small companies, 8 percent of medium companies. (All large companies provided company-paid formal training to at least some employees.) See Figure 20 for more detail. The pattern continued for other training-related questions, with smaller shares of very small companies, and larger shares of large and medium companies, investing in training.

Figure 20. Employees Receiving Company-Paid Training Each Year, by Company Size



Preferred providers for the most effective education and training varied by company size. According to respondents, larger than average shares of large and medium companies relied on community and technical colleges (66 percent and 70 percent, respectively, compared with 61 percent statewide), consultants and external training companies (39 percent and 28 percent, respectively, compared with 25 percent statewide) and universities (34 percent and 26 percent, respectively, compared with 22 percent statewide). Business and industry associations were one of the top providers of training for all companies, but particularly for small, medium and large businesses, and somewhat less so for very small businesses.

While small companies responded at rates similar to state averages, very small companies relied to a lesser degree on these major sources of education and training than companies of other sizes. They mostly favored community and technical colleges (47 percent) and business and industry associations (30 percent), followed by universities (16 percent) and manufacturing extension partnerships (14 percent).

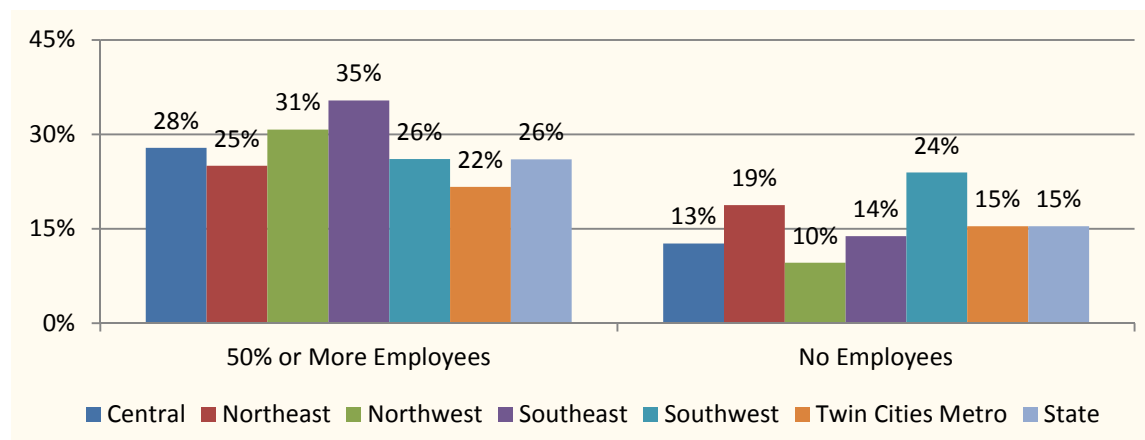
At each company size level, respondents were more likely to rate community and technical colleges in the top half of the usefulness scale for training students in skills for business needs, compared with for training or upgrading skills of current workers. Large companies (83 percent of respondents) were more likely to rate community and technical colleges in the top half of the usefulness scale for training students in skills for business needs, than companies of other sizes (68 percent to 70 percent). Very small companies (42 percent) were less likely to rate community and technical colleges in the top half of the usefulness scale for training or upgrading skills of current workers, than companies of other sizes (54 percent to 57 percent).

Training Resources: by Region

Companies varied widely by region on their approaches to company-paid formal training. Between one-fifth and one-fourth of respondents in most regions spent at least 3.0 percent of payroll on employee training: 23 percent of respondents in Northwest, Northwest and Southeast; 21 percent in Central and the Twin Cities. Southwest (17 percent) had the lowest share of respondents spending at least 3.0 percent of payroll on employee training.

Respondents in Central were the least likely to have a training budget (30 percent). Responding businesses in Northwest (35 percent) were the most likely to have increased their budgets, while Southwest respondents were the most likely to have maintained (45 percent) or decreased (15 percent) their training budgets.

For respondents who provided training, Central (56 percent) and the Twin Cities (57 percent) were more likely to provide company-paid training to less than one-quarter of employees. Compared with other regions, employers in Southwest (24 percent) were the most likely to provide no company-paid training to employees, while those in Southeast (34 percent) were the most likely to provide company-paid training to 75 to 100 percent of their employees.

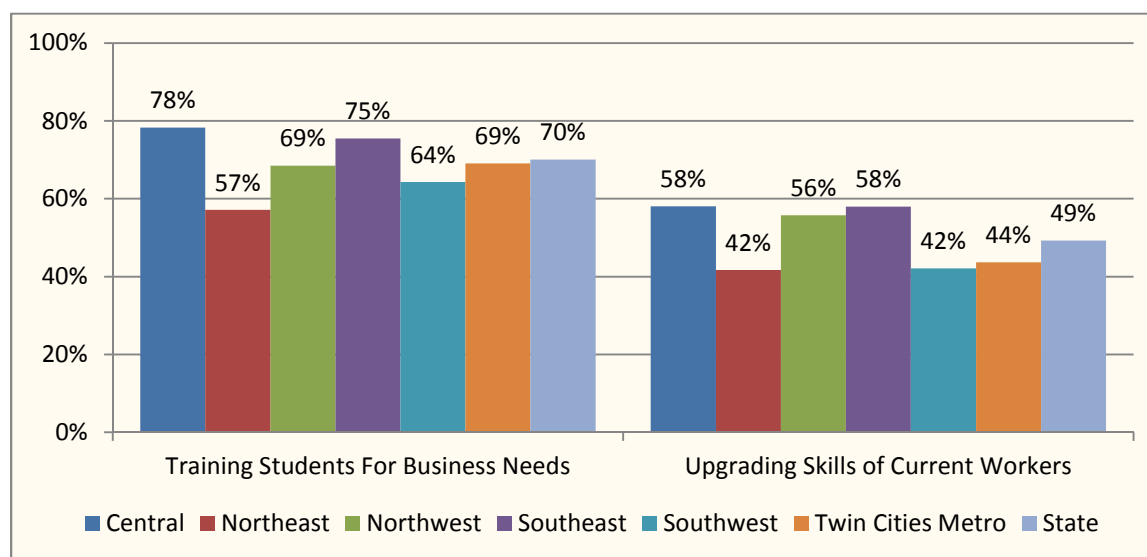
Figure 21. Employees Receiving Company-Paid Training Each Year, by Region

In terms of preferred training providers for the most effective education and training, Northeast (72 percent, compared with 61 percent statewide) and Central (65 percent) respondents were more likely to favor community and technical colleges. Business and industry associations received were preferred for training particularly by respondents in Central (45 percent) and Southeast (46 percent), compared with the state average of 37 percent. Consultants and external training companies were preferred by respondents in Northwest, Southeast and Southwest (30 percent to 31 percent) to a greater degree than in other regions (19 percent to 24 percent).

Northwest had a relatively higher preference than most other regions for training by consultants and external training companies (30 percent), manufacturing extension partnerships (25 percent) and federally funded training programs (7 percent). A larger share of respondents in Southeast (16 percent) preferred online training providers (among their top three providers) than in other regions (8 percent to 14 percent). A larger share of business respondents in Northeast (16 percent) selected state and local government agencies among their top three providers than in other regions (2 percent to 7 percent).

In each region, respondents were more likely to rate community and technical colleges in the top half of the usefulness scale for training students in skills for business needs, compared with training or upgrading skills of current workers. Central (78 percent) and Southeast (75 percent) were much more likely to rate community and technical colleges in the top half of the usefulness scale for training students in skills for business needs than respondents in other regions (57 percent to 69 percent). Central and Southeast respondents were also more likely to rate community and technical colleges in the top half of the usefulness scale for upgrading skills of current workers than those in other regions.

Figure 22. Share of Respondents Rating Community and Technical Colleges in the Top Half of the Usefulness Scale for Training



Skills and Abilities

According to respondents, employees will need more training or qualifications over the next three years, respondents in four main areas (selected by at least 40 percent of respondents): computer skills (50 percent), process improvement (45 percent), technical skills (43 percent) and problem-solving skills (40 percent). In contrast, computer skills (50 percent) and basic employability skills (41 percent) were the only skills selected by more than 40 percent of respondents in the 2007 survey.

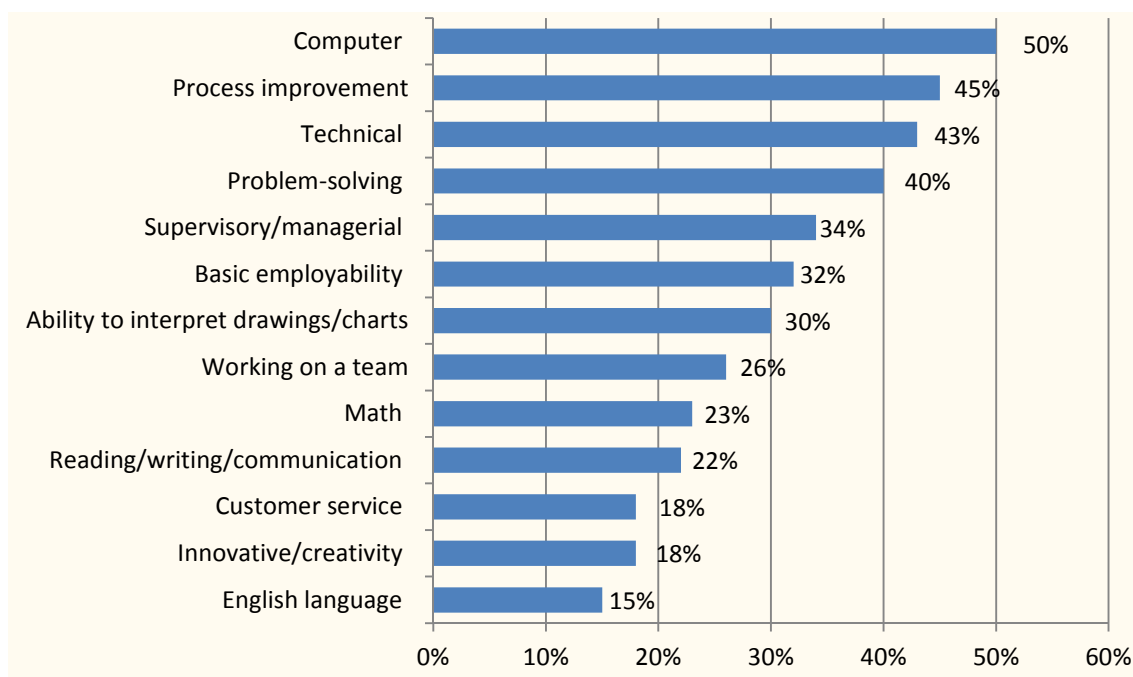
Supervisory and managerial skills, basic employability skills (attendance, timeliness, teamwork) and the ability to read and translate drawings/diagrams/flow charts were selected by at least 30 percent of respondents.

The skill areas where employees were least likely to need more training or qualifications were innovative and creativity skills (18 percent), customer service skills (18 percent) and English language skills (15 percent). More data is included in Figure 23.

Some patterns of areas needing more training emerged across the regions. Central, Northwest, Southeast and Southwest identified the same top five areas needing more training. Compared to these four regions, the Twin Cities differed in one of its top five areas. Northeast differed from its Greater Minnesota counterparts in two of its top five areas.

All regions placed computer skills and process improvement among the top five areas in which employees would need more training or qualifications over the next three years. Problem solving skills and technical skills were two other key areas, each chosen by at least 35 percent of respondents in each region, except for the Northeast.

Figure 23. Skills in Which Employees Need More Training or Qualifications in Next Three Years



Source: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," survey results, Minnesota Department of Employment and Economic Development, 2011.

Additional training in basic employability skills (e.g. attendance, timeliness and teamwork) will be critical to Greater Minnesota in the next three years. Between 37 percent and 43 percent of respondents in each region in Greater Minnesota cited basic employability skills among its top five areas needing more training, far exceeding the 22 percent share in the Twin Cities.

Northeast respondents differed from those in other Greater Minnesota regions, by selecting math skills among their top five areas needing more training. It is likely that problem solving and technical skills are also important to Northeast employers but that basic employability skills and math skills supersede these needs.

While additional training for supervisory and managerial skills was needed by more than 30 percent of respondents in all regions, it was among the top five areas needing more training for only Northeast and the Twin Cities.

English language-related training will be needed the most in the Twin Cities (23 percent), followed by Central (11 percent) and Southeast (13 percent), over the next three years.

Standardized Work Readiness and Metal-Forming Certifications

Respondents were asked about two specific programs, one that would certify work readiness and another that would certify metal-forming skills for production workers. Respondents reacted much more favorably to the idea of a work readiness certification program, with 44 percent rating it essential or useful (the top half of the usefulness scale) and 21 percent rating it not useful. On the other hand, responding manufacturers were less enthusiastic about a potential metal-forming certification, with only 30 percent rating it in the top half of the usefulness scale and almost half (49 percent) saying that it would not be useful. These results were also comparable to those in the 2007 survey.

Larger companies were more likely to see the benefit of certifications than smaller companies. With respect to a work readiness certification program, greater shares of large (58 percent) and medium (52 percent) companies rated this option in the top half of the usefulness scale compared with small (40 percent) and very small (37 percent) companies. While about half of respondents, in all size groups, rated the metal-forming certification as not useful, large companies (43 percent) were more likely to rate it in the top half of the usefulness scale than very small companies (22 percent).

Respondents were asked to indicate whether six specific competency areas related to metal-forming certification for production workers (as defined by the National Institute for Metalworking Skills) were essential skills. Between 50 percent and 60 percent of respondents considered the following skills to be essential: tooling skills; work planning and job control skills; inspection and quality assurance skills; and adherence to U.S. Environmental Protection Agency (EPA) and U.S. Department of Labor Occupational Safety and Health Administration (OSHA) guidelines. In contrast, handling of materials and related fluids skills (36 percent) and operation of metal-forming equipment (34 percent) were essential for a smaller share of respondents. (These results are similar to those in the 2007 survey, although the percentages of respondents rating the top four competency areas were higher than in the previous survey, which ranged from 46 percent to 55 percent.)

Between one-fifth and one-quarter of respondents indicated workers were usually qualified in these competency areas. Many employers provided training in these four key areas (44 percent to 63 percent). A further examination shows that respondents who considered the skills to be essential were much more likely to provide related training (67 percent to 82 percent, depending on the skill area) than those who did not (21 percent to 36 percent).

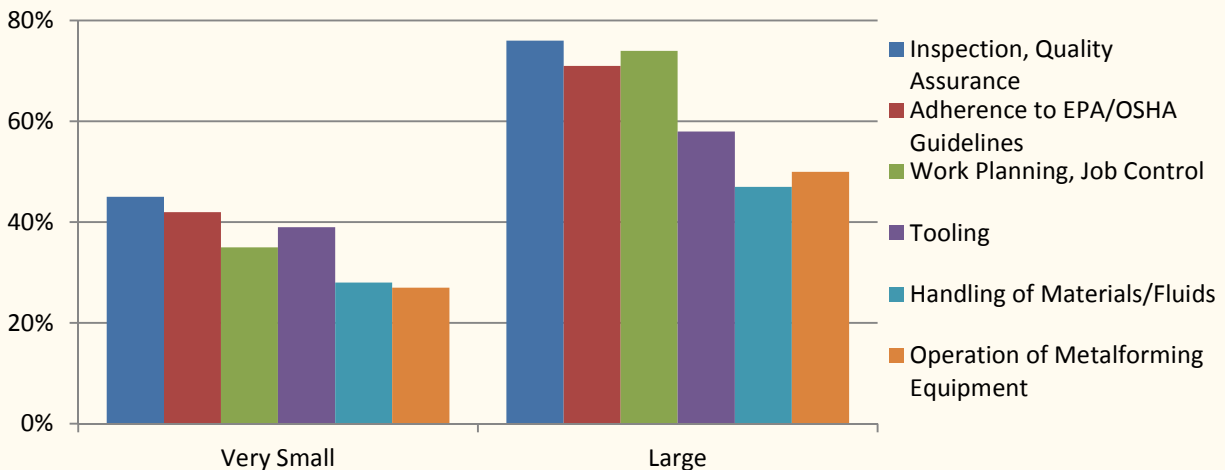
Table 7. Metal-Forming Competency Areas

Competency Area	Skills are essential.	Employer provides training.
Inspection and Quality Assurance Skills	60%	59%
Adhere to EPA and OSHA Guidelines	58%	63%
Work Planning and Job Control Skills	52%	51%
Tooling Skills	50%	44%
Handling of Materials and Related Fluids Skills	36%	41%
Operation of Metal-forming Equipment	34%	34%

Source: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," survey results, Minnesota Department of Employment and Economic Development, 2011.

By company size, higher percentages of responding large companies said the skills were essential compared with very small companies. While more than 70 percent of large companies said inspection and quality assurance skills, adherence to EPA and OSHA guidelines, and work planning and job control skills were essential skills, 35 percent to 45 percent (depending on the skill area) of very small companies agreed.

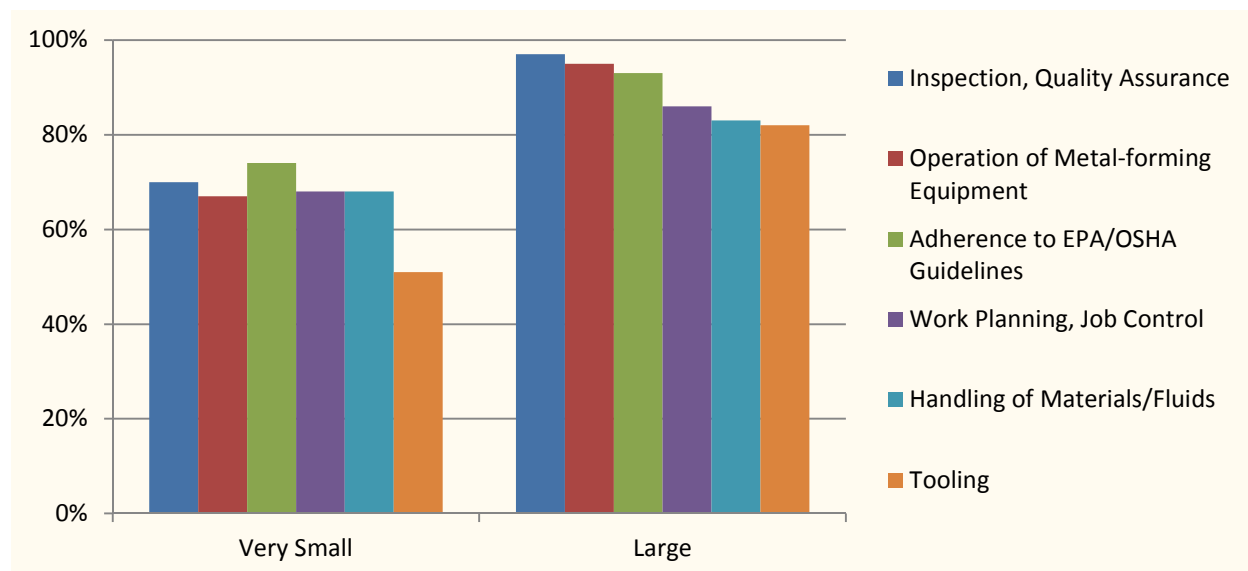
Figure 24. Metal-forming Certification Skills Are Essential: Large vs. Very Small Companies



Overall, while two-thirds or more (66 percent to 84 percent) of responding large companies provided training in these three most essential skill areas (inspection and quality assurance skills, adherence to EPA and OSHA guidelines, and work planning and job control skills), less than half of very small companies did (35 percent to 47 percent). Small and medium respondents answered close to the average of all respondents (as shown in Table 7).

Further, if companies consider the skills to be essential, they are far more likely to provide training. This tendency is stronger among large companies (82 percent to 97 percent provide training among those that consider the skills to be essential) than very small companies (51 percent to 74 percent). In addition, large companies who considered the skills to be essential were much more likely to provide training than large companies who did not (10 percent to 44 percent). See Figure 25 for more detail.

Figure 25. Metal-working Certification Skills are Essential and Company-Paid Training Is Provided



Overall, respondents in Northwest (40 percent) and Southeast (35 percent) were more likely to rate metal-forming skills certification in the top half of the usefulness scale compared with 30 percent statewide. Respondents in Southeast (50 percent) and Southwest (58 percent) were relatively more interested in a standardized work readiness certification compared with 44 percent statewide. In view of these results, educational institutions could study demand for such programs particularly in these regions.

For most skill areas and regions, about one-sixth to one-fourth of respondents said that workers were qualified in the six specified competency areas for metal-forming certification. However, shares of respondents in Southwest were notably lower than average in five of the six competency areas.

Advance Planning for an Aging Workforce

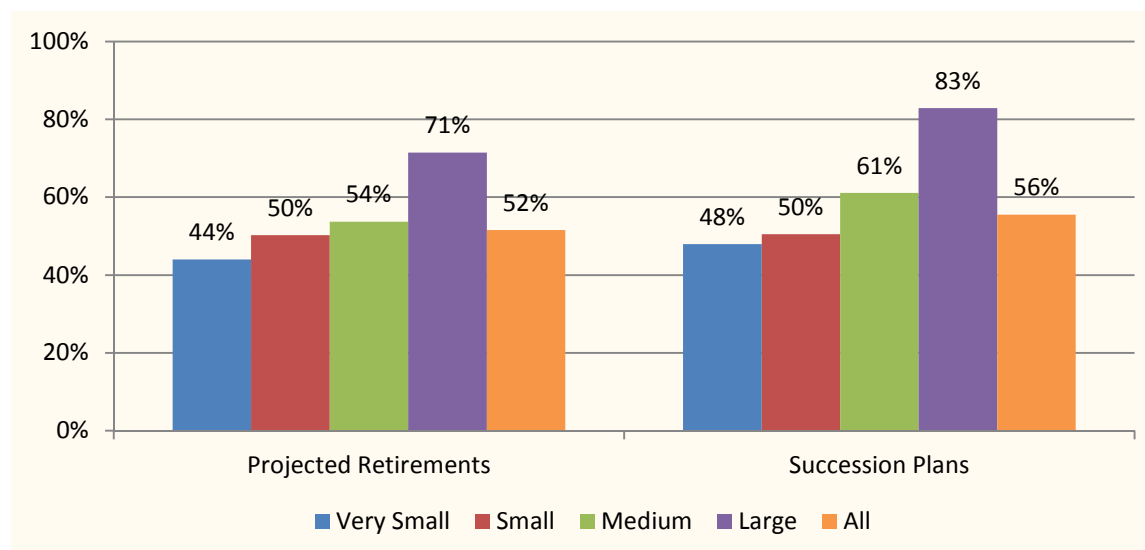
The aging workforce will have an important impact on workforce shortages in the coming years. While Minnesota's population of people aged 65 and older is expected to grow 100 percent between 2010 and 2035, the working age population (age 25 to 64) is expected to grow a mere 5 percent, according to population projections published by the Office of the State Demographer at the Minnesota Department of Administration. These factors will have an important impact on manufacturers.

Despite these imminent demographic trends facing manufacturers, only slightly more than half had assessed the impact of the aging workforce on projected retirements (52 percent) and succession plans (56 percent).

According to the 2011 Deloitte/MI report, the aging workforce and anticipated retirements will most greatly impact skilled production (75 percent of U.S. respondents), production support (40 percent) and management and administration (40 percent). Lower impacts are expected on scientists and engineers (20 percent) and sales and marketing (21 percent).

These averages mask the level of preparation by company size. Large companies may be better prepared to bear the impact of the aging workforce: 71 percent of respondents had assessed the impacts of projected retirements and 83 percent of respondents had made succession plans. While 61 percent of responding medium companies had made succession plans, only slightly over half had planned for projected retirements. Small and very small companies had made the least plans in these areas (44 percent to 50 percent).

Figure 26. Has Your Company Assessed the Impact of the Aging Workforce on Projected Retirements and Succession Planning



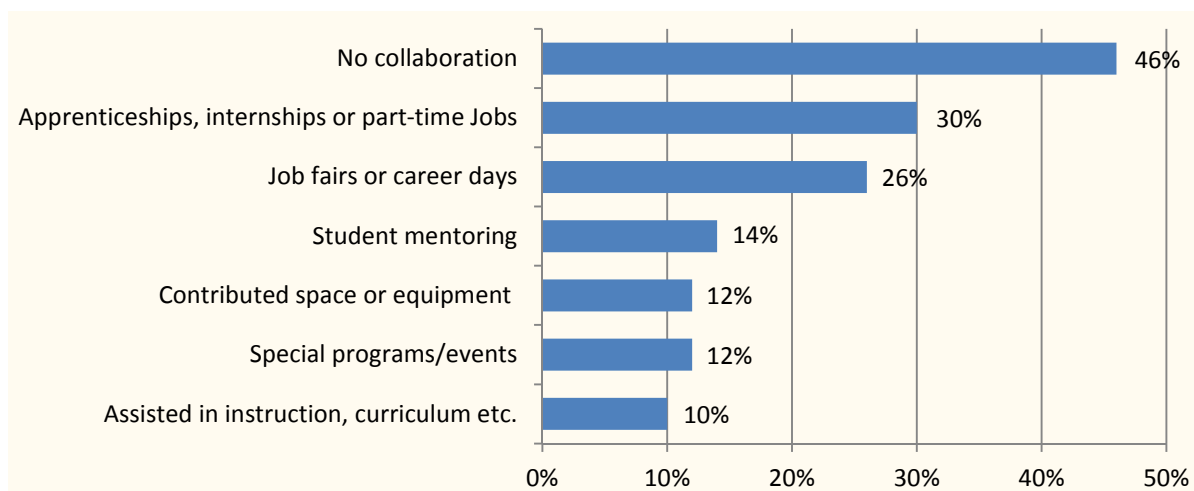
Reported levels of preparation for the aging workforce varied by region. Respondents from Northeast (61 percent) had made relatively more plans for projected retirements than those from Northwest (43 percent) and Southwest (41 percent). Other regions were clustered around the state average of 52 percent. Succession plans were the most prevalent among respondents from Southeast (64 percent) but the least common among respondents from Southwest (41 percent); other regions responded closer to the state average of 55 percent.

Business Collaboration with Education System

Slightly more than half (54 percent) of companies had collaborated with local secondary and post-secondary schools. The main motivations were to promote the industry to students, teachers and parents (26 percent); recruit new employees (24 percent) and conduct community outreach and citizenship activities (23 percent).

The most common activities were student apprenticeships and internships (30 percent), job fairs or career days (25 percent) and student mentorships (14 percent). Figure 27 includes additional forms of business-education collaboration.

Figure 27. Forms of Business-Education Collaboration



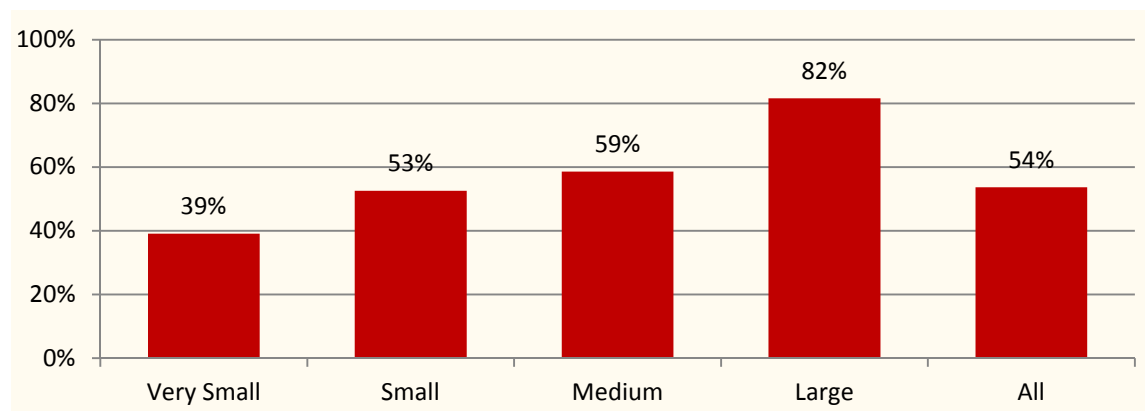
Note: Collaboration types with at least 10 percent of respondents participating are shown. Not shown are developed curriculum (7 percent), incorporated industry standards in curriculum (5 percent), hosted teachers for summer internships (4 percent), other (5 percent).

Source: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," survey results, Minnesota Department of Employment and Economic Development, 2011.

Collaboration: by Company Size

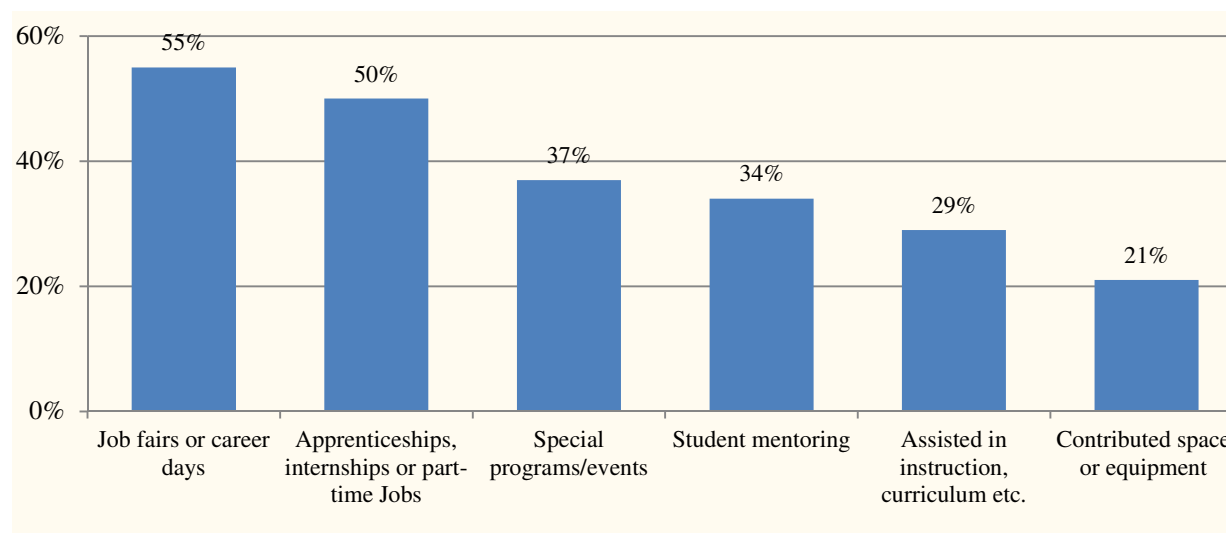
Large companies had the largest participation rate of business-education collaboration (82 percent). A much smaller percentage of very small companies had collaborated with the education system than companies of other sizes. About 39 percent of very small companies had participated in business-education collaboration, compared with 54 percent statewide and 82 percent for large companies

Figure 28. Percentage of Respondents with Participation in Business-Education Collaboration, by Company Size



Very small (7 percent) and small companies (22 percent) participated in job fairs or career days at particularly low rates, compared with large companies (55 percent) and medium companies (38 percent). Large companies had the highest participation rate in each of the types of business-education collaboration. The most popular types were job fairs and career days (55 percent of respondents); and apprenticeships, internships and part-time jobs (50 percent); followed by special programs and events (37 percent); and student mentoring (34 percent). See Figure 29 for more information.

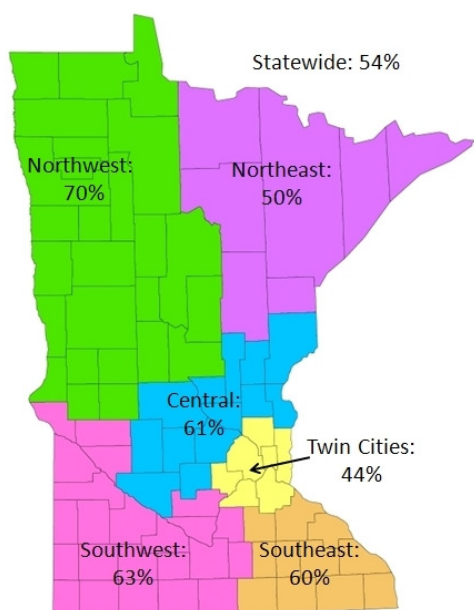
Figure 29. Major Types of Business-Education Collaboration by Large Companies



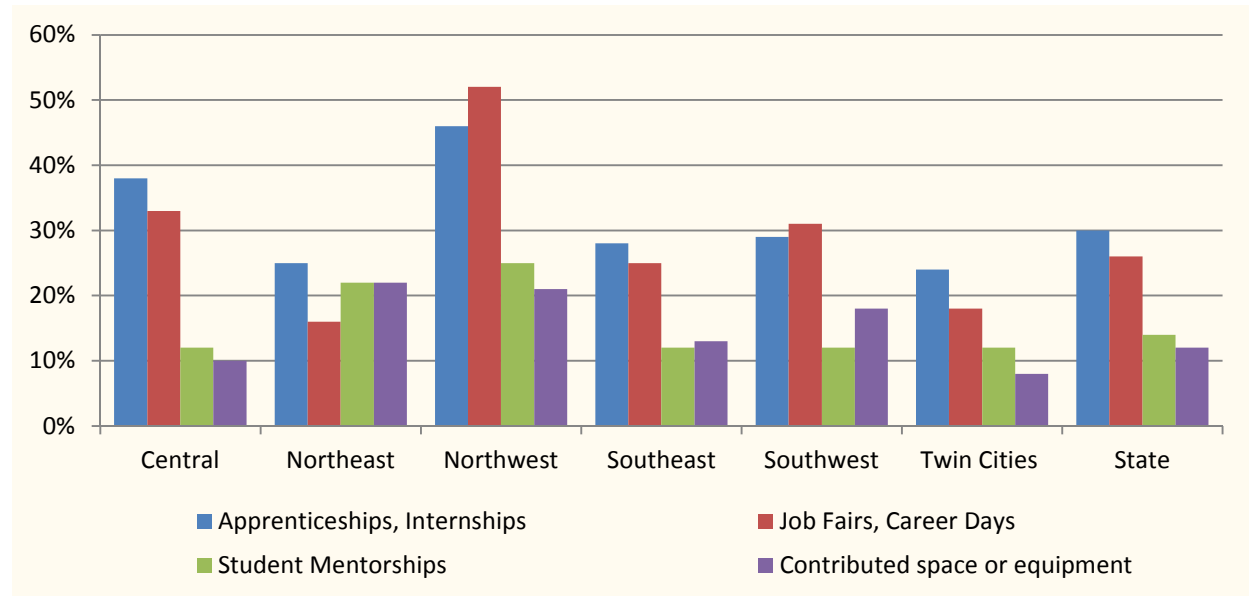
Collaboration: by Region

Regional differences for business-education collaboration with educational institutions were striking. Most regions had substantial differences from the statewide average of the 54 percent participation rate in business-education collaboration. Northwest respondents were most active with business-education collaborations, with the highest participation rate (70 percent). On the other hand, at least half of respondents in the Twin Cities (56 percent) and Northeast (50 percent) had not participated in business-education collaborations.

Figure 30. Participation Rates in Business-Education Collaboration, by Region



Participation in job fairs or career days was most common for respondents in Northwest (52 percent), followed by Central (33 percent) and Southwest (31 percent). Youth apprenticeship and internship programs were most common among business respondents in Northwest (46 percent) and Central (38 percent). Respondents in Northwest and Northeast were more likely to have mentored students or have contributed space or equipment. Compared with other regions, Northwest (30 percent) was more involved in special events and programs, while Northeast (25 percent) was more involved in assisting in instruction and curriculum development. Some of these patterns differed from results from the 2007 survey.

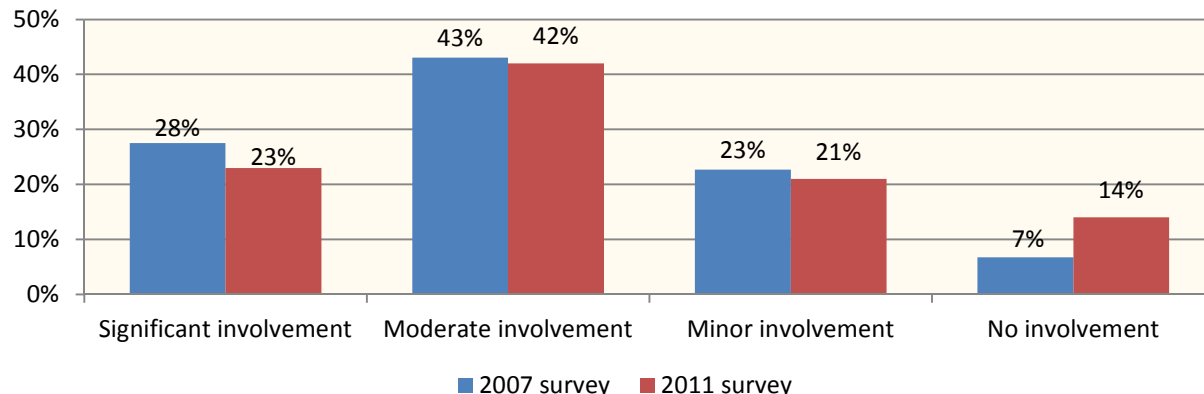
Figure 31. Most Common Types of Business-Education Collaboration by Region

Government Involvement

Prior to the survey, 88 percent of responding companies were aware of the State of Minnesota's workforce and placement services (such as MinnesotaWorks.net and WorkForce Centers). This was consistent for companies of in all size groups (85 percent to 90 percent awareness). This was an improvement since the 2007 survey in which 78 percent of very small companies had been aware of these services, compared with the state average of 87 percent. Respondents in Central (90 percent), Northwest (89 percent) and Southwest (89 percent) had relatively higher awareness of the State of Minnesota's workforce and placement services than those in the Twin Cities (81 percent).

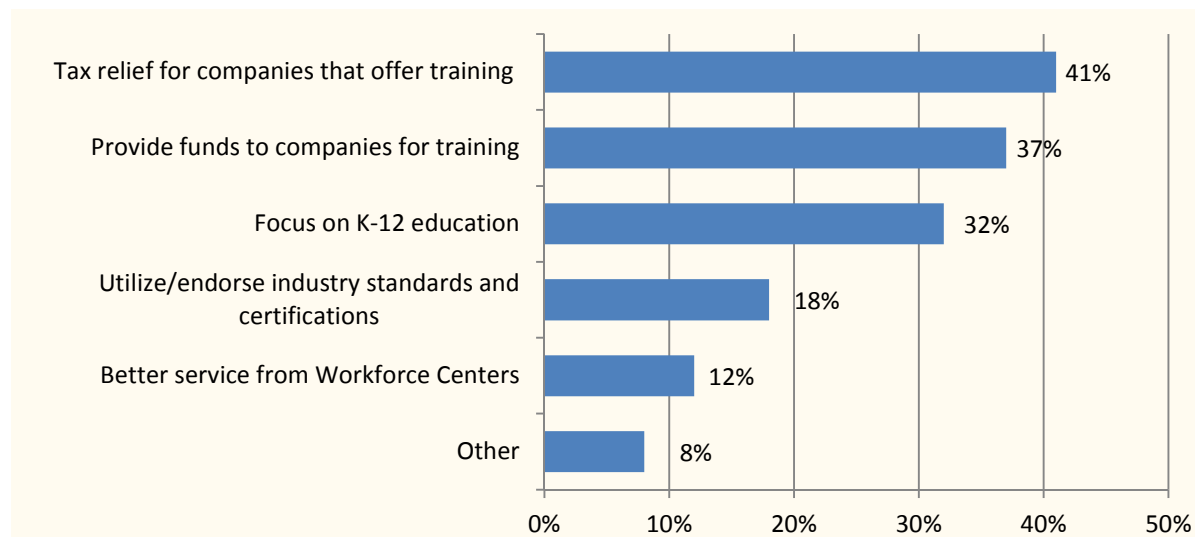
About two-thirds of responding manufacturers desired at least a moderate level of government involvement in attracting and retaining an effective workforce. A large share of respondents (42 percent) believed the state should have moderate involvement in assisting them with this goal. Approximately the same shares of manufacturers preferred significant state involvement (23 percent) and minor state involvement (21 percent). Most of these results are comparable to the 2007 results, except that the share of respondents preferring no state involvement doubled from 7 percent in 2007 to 14 percent in 2011.

Figure 32. Desired Level of State Government Involvement in Developing an Effective Workforce



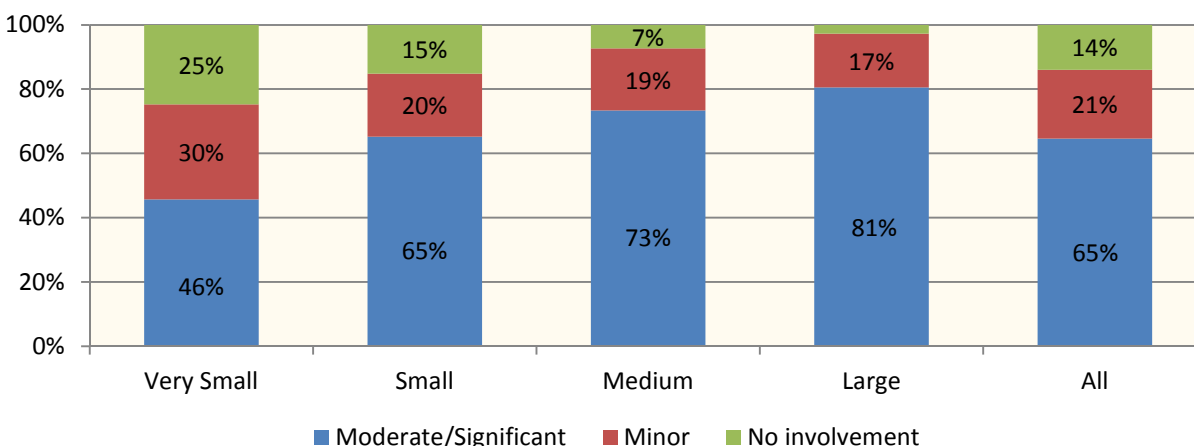
Types of involvement preferred by respondents varied, as reported in Figure 11. Most respondents preferred either tax relief (41 percent) or direct funding for companies to provide employee training (37 percent). About one-third of respondents (32 percent) recommended that the State focus on K-12 education to address manufacturing workforce needs. These results mirror those reported in the 2007 survey.

Figure 33. Preferred Forms of State Support for Manufacturing Workforce Development



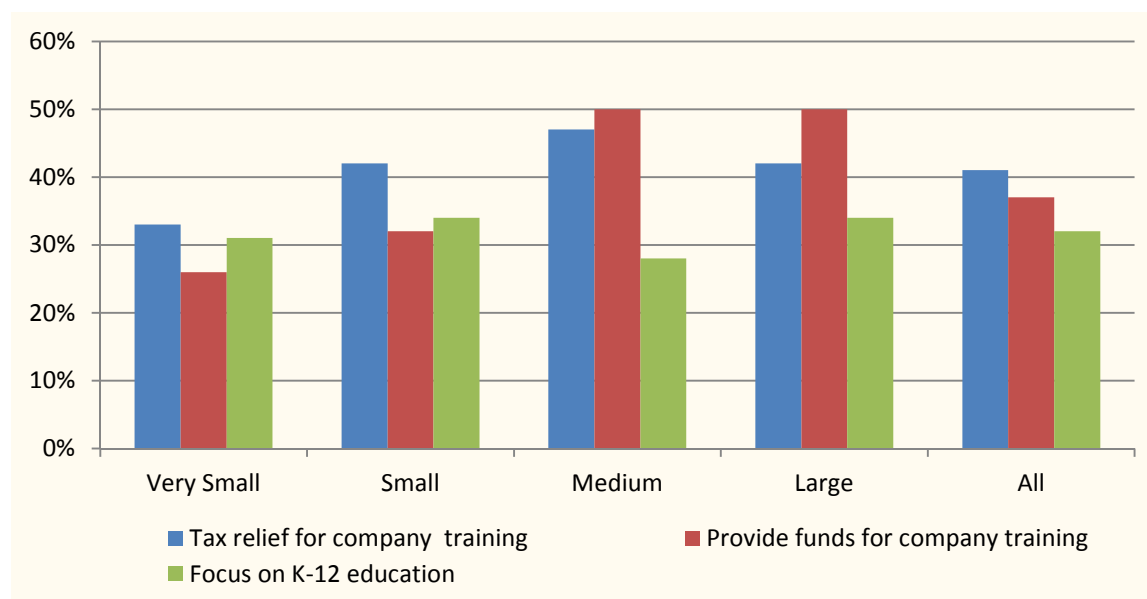
Government Involvement: by Company Size

A higher proportion of large (81 percent) and medium (73 percent) companies than small companies (65 percent, equal to the average) and very small companies (46 percent) supported moderate to significant involvement of state government in developing an effective workforce. Very small companies were supported no government involvement (25 percent) or minor involvement (30 percent) the most, compared with other size groups.

Figure 34. Level of State Government Involvement, by Company Size

Very small companies were less supportive of State efforts to support employee training, compared with companies of other sizes. One-third of very small companies (33 percent) supported tax relief for companies offering employee training, compared with between 42 percent and 47 percent of companies of other sizes that supported this measure.

Also, very small companies (26 percent) and small companies (32 percent) supported the State providing funds for employee training to a much lesser degree than medium (50 percent) and large (50 percent) companies. Further, small and very small companies favored tax relief measures more than direct funding by the State for employee training, while medium and large companies favored direct funding more than tax relief measures. Companies in all size groups selected the third most common effort – focus on K-12 education – in about the same proportion.

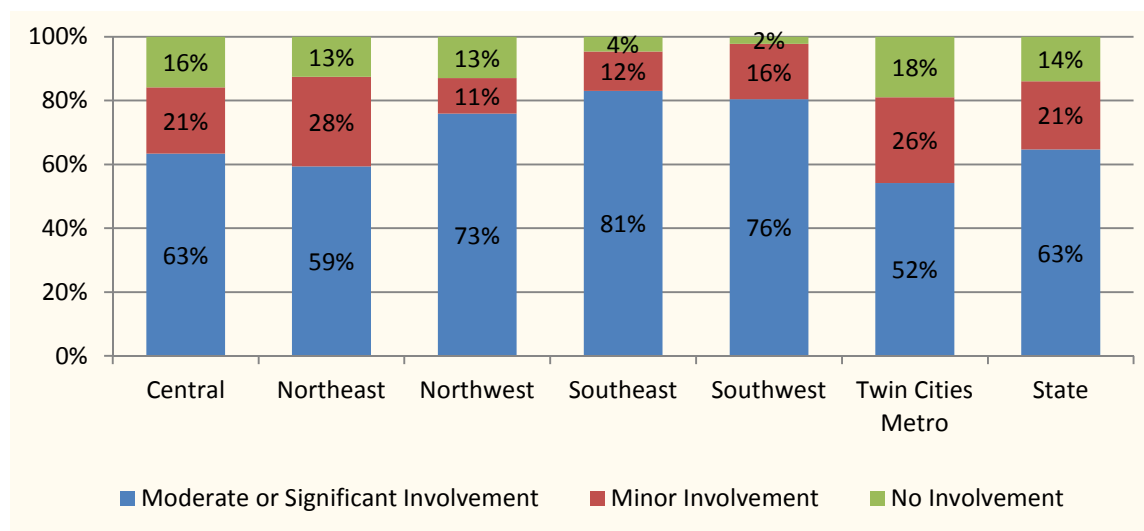
Figure 35. Measures for the State of Minnesota to Develop a Highly Effective Manufacturing Workforce

Government Involvement: by Region

Respondents in Southeast (81 percent), Southwest (76 percent) and Northwest (73 percent) were substantially more likely to favor significant or moderate involvement by the State for assisting manufacturers to meet workforce needs, while the Twin Cities (18 percent) and Central (16 percent) favored no involvement by the State the most. See Figure 36 for more details.

Half or more of respondents in Northwest and Northeast were in favor of tax relief for companies providing training (compared with 41 percent statewide). Northwest respondents were also the most in favor of funding for employee training at companies (46 percent compared with 37 percent statewide).

Figure 36. Desired Government Involvement, by Region



Comparisons to Results from National Surveys

The DEED survey conducted in 2011 strongly resembled the one DEED conducted in 2007, except for some minor changes in wording and the addition of a question related to the impact of the aging workforce on succession planning and projected retirements. Questions in the DEED survey had been drawn from some of those used in the “2005 Skills Gap Report: A Survey on the American Workforce.” That study was conducted by Deloitte, the Manufacturing Institute and the National Association of Manufacturers (NAM) in 2005. Deloitte and the Manufacturing Institute (MI) repeated this survey in 2011.

This section compares results for some questions included in both the 2011 DEED survey and the 2011 Deloitte/MI study, highlighting any differences and similarities in the results. It is useful to analyze these differences and similarities in order to better understand the needs of Minnesota manufacturers.

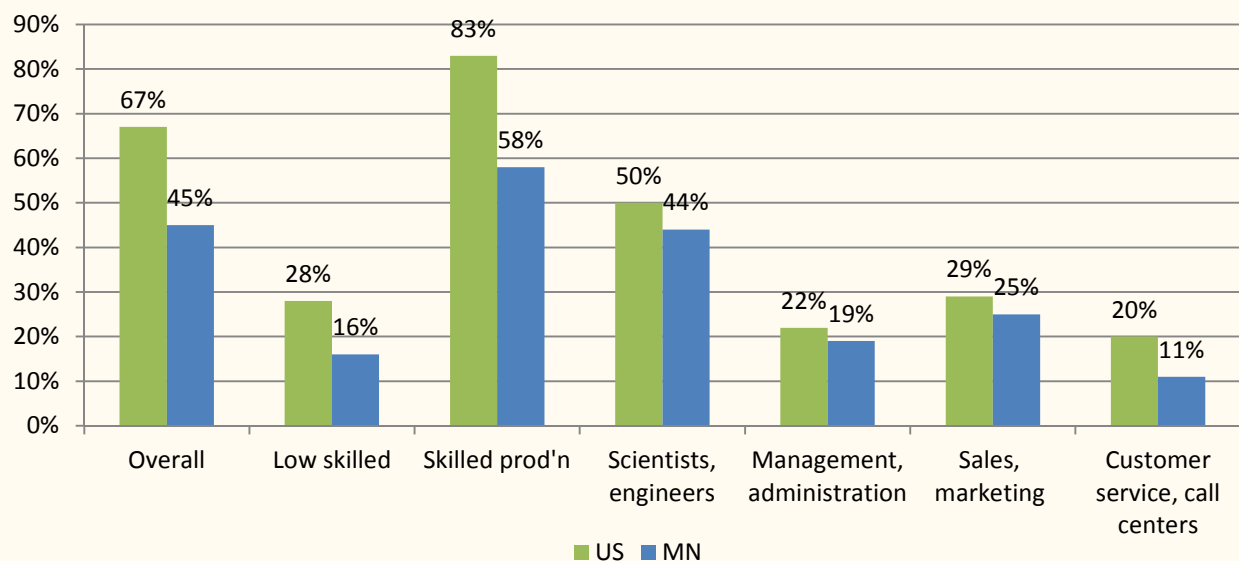
Current Moderate to Serious Workforce Shortages

Respondents reported their current workforce shortages by occupational groups in both the 2011 Deloitte/MI survey and the 2011 DEED survey. In the overall workforce, 45 percent of Minnesota respondents reported experiencing a moderate to serious shortage of workers, compared with 67 percent of U.S. manufacturers. Thus, U.S. manufacturers appeared to face tighter labor market for qualified workers than Minnesota manufacturers. This was valid across all occupational groups. See Figure 37 for more detail.

(Minnesota and U.S. data are discussed for comparison purposes. However, Minnesota and U.S. data may not be comparable because of different rating scales. In the DEED survey, the question had a 3-point response scale: serious shortage, moderate shortage or no shortage. In the Deloitte/MI survey, the question had a 4-point response scale: serious shortage, moderate shortage, low shortage or no shortage. The 2007 and 2011 DEED surveys and the 2005 NAM/Deloitte/MI study all used the same scale.)

Minnesota respondents speculated that shortages in three to five years would be most acute for skilled production (64 percent) and scientists and engineers (52 percent). While the 2011 Deloitte/MI did not ask the same question for anticipated workforce shortages, U.S. respondents indicated that their greatest hiring challenges would be in skilled production (80 percent of respondents), production support (48 percent), and scientists and engineers (29 percent).

Figure 37. Current Moderate to Serious Workforce Shortages, Minnesota vs. U.S.



Note: Minnesota and U.S. data are shown for comparison purposes. However, Minnesota and U.S. data may not be comparable because of different rating scales. In the DEED survey, the question had a 3-point response scale: serious shortage, moderate shortage or no shortage. In the Deloitte/MI survey, the question had a 4-point response scale: serious shortage, moderate shortage, low shortage or no shortage.

Sources: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," survey results, Minnesota Department of Employment and Economic Development, 2011.

"Boiling Point? The Skills Gap in U.S. Manufacturing," Deloitte and The Manufacturing Institute, 2011.

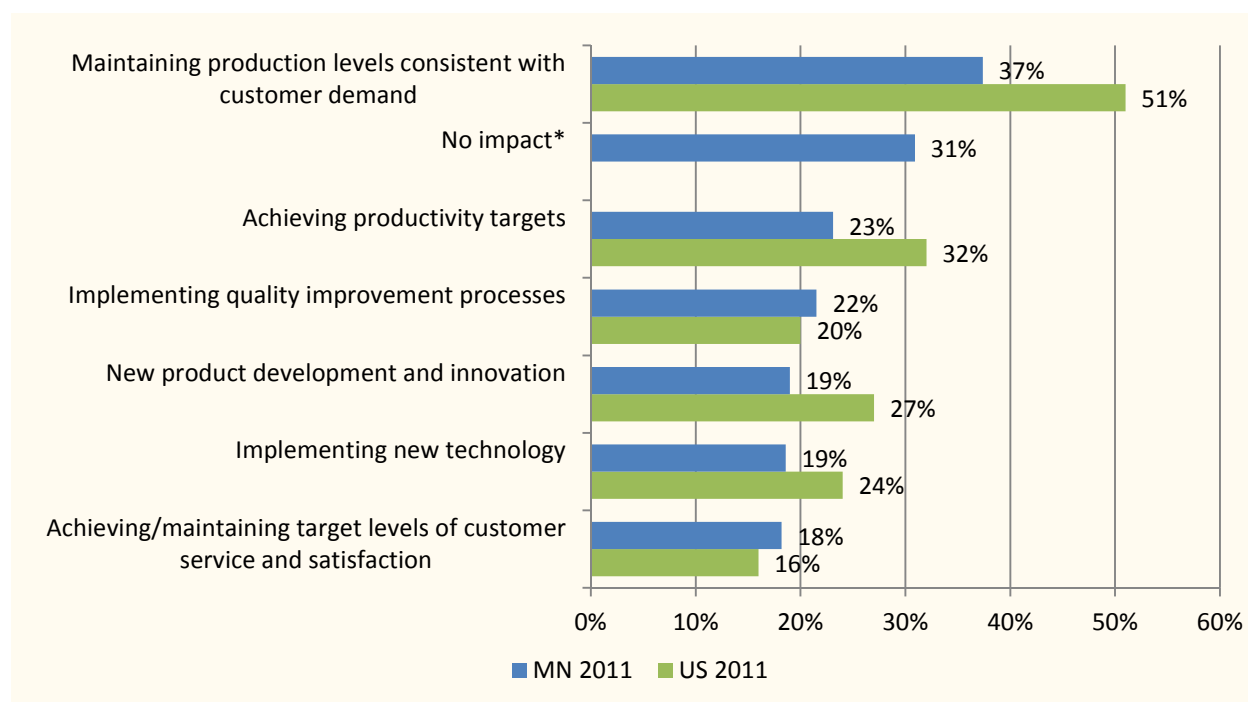
Impact of Workforce Shortages on Business Operations

Minnesota manufacturers assessed that workforce shortages would have the greatest impacts on maintaining production levels consistent with customer demand (37 percent), followed by achieving productivity targets (23 percent) and implementing quality improvement processes (22 percent). However, a large share of companies had experienced no impacts from workforce shortages (31 percent).

According to the 2011 Deloitte/MI study, workforce shortages also have major impacts on U.S. manufacturers' ability to maintain production levels consistent with customer demand (51 percent) and achieve productivity targets (32 percent). U.S. manufacturers appeared to be affected to a greater degree than Minnesota manufacturers.

Workforce shortages affected a greater share of U.S. manufacturers in new product development and innovation and implementing new technology, than Minnesota manufacturers. See Figure 38 for more detail.

Figure 38. Impact of Workforce Shortages, Minnesota vs. U.S.



* Not reported in the 2011 Deloitte/MI results. The Deloitte/MI study also included additional options that were not in the DEED study, such as maintaining quality levels consistent with customer requirements (35 percent of national respondents), effective sales and marketing (17 percent) and effective supply chain planning and management (13 percent).

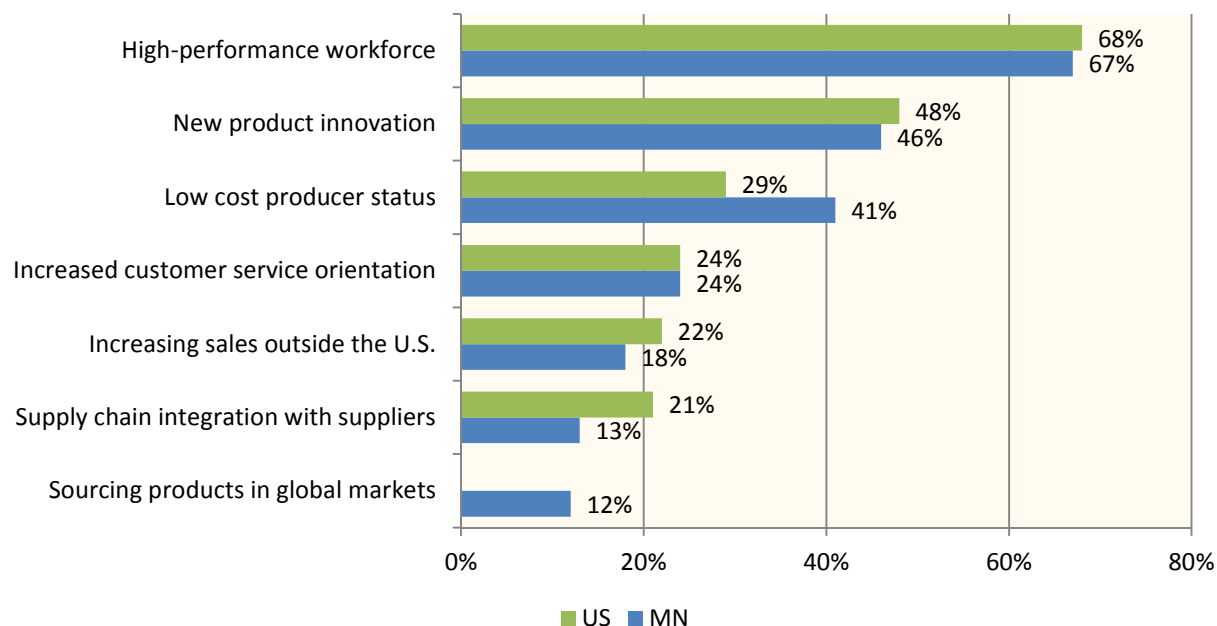
Sources: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," survey results, Minnesota Department of Employment and Economic Development, 2011.

"Boiling Point? The Skills Gap in U.S. Manufacturing," Deloitte and The Manufacturing Institute, 2011.

Most Important Factors for Business Success

Minnesota and U.S. manufacturers agreed that the top two factors for business success were a high-performance workforce and new product innovation. A high-performance workforce continued to be the principal factor in Minnesota and nationwide, according to about two-thirds of all respondents. New product innovation was the second-most important factor for almost one-half of respondents in Minnesota (46 percent) and in the nation (48 percent). See Figure 38 for more detail.

Figure 39. Factors for Business Success, Minnesota vs. U.S.



Note: The 2011 Deloitte/MI survey included “increased market share” as an additional response option. It was selected by 38 percent of national respondents. That survey excluded “sourcing products in global markets” as a response option.

Sources: “Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey,” survey results, Minnesota Department of Employment and Economic Development, 2011.

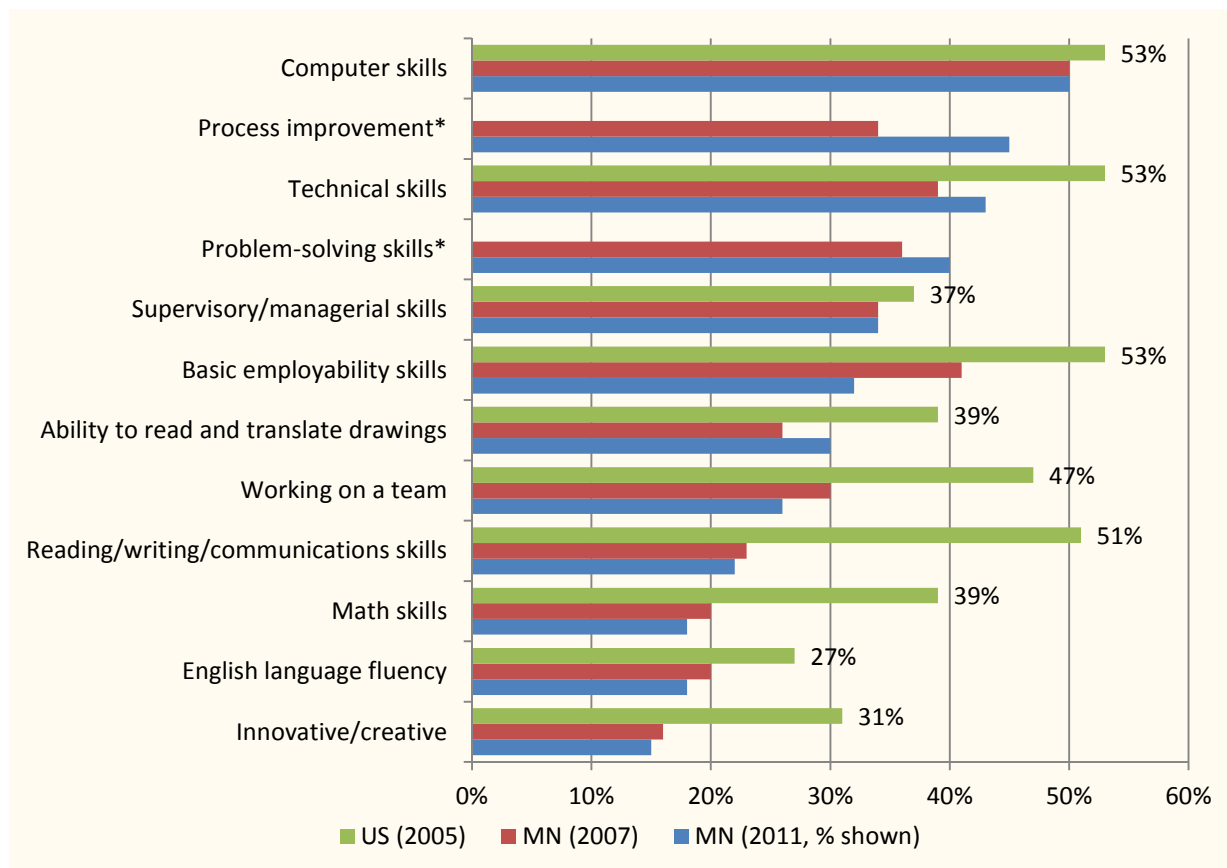
“Boiling Point? The Skills Gap in U.S. Manufacturing,” Deloitte and The Manufacturing Institute, 2011.

Skill Areas in Which Workers Will Need More Training

Differences existed between national and Minnesota results in levels of demand for worker skills over the next three years. Minnesota businesses placed more emphasis on computer skills and supervisory and managerial skills than businesses nationwide. Minnesota’s survey also included additional skills not included in the national survey: problem-solving skills (ranked fourth at 40 percent) and process improvement (ranked second at 45 percent). The share of respondents indicating greater need for these two skill areas have increased since the 2007 survey.

Minnesota businesses placed less emphasis on reading/writing/communication skills, basic employability skills, math skills and teamwork skills. Perhaps this is related to Minnesota's high-performing high school and college graduates. Minnesota ranks second among states in the percentage of the population aged 25 years and older with a high school diploma. Minnesota also had the highest average ACT composite score (22.9) among the 27 states from which more than half of the college-bound students took the test in 2011. Comparisons with the 2005 NAM and 2007 DEED surveys are included in Figure 39.

Figure 40. Skills Areas in Which Workers Will Need More Training, Minnesota vs. U.S. (2005)



*Problem-solving skills and process improvements were included in the Minnesota survey, but not in the NAM survey.

Sources: "Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey," survey results, Minnesota Department of Employment and Economic Development, 2011.

"2005 Skills Gap Report," Deloitte, National Association of Manufacturers, and The Manufacturing Institute.

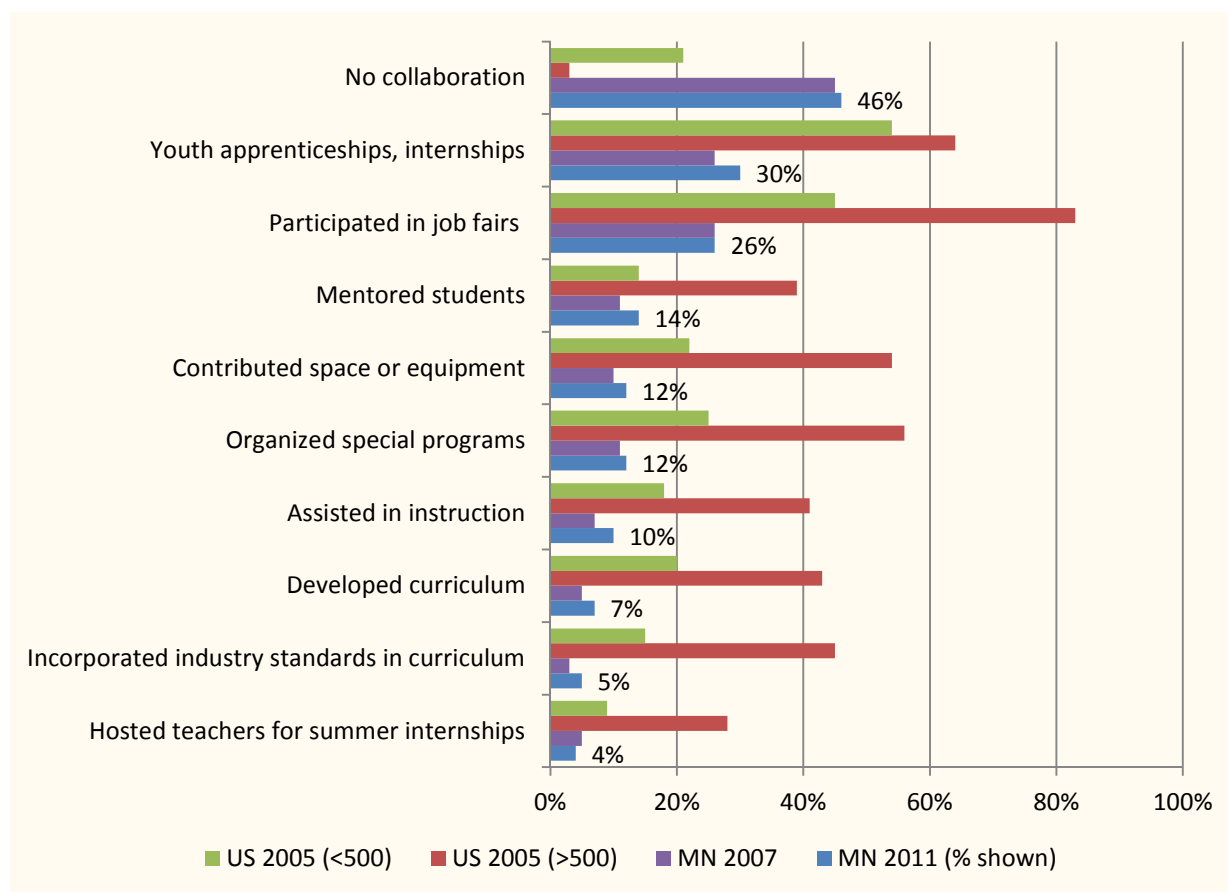
Collaboration with the Education System

In collaborating with schools, there was major difference between Minnesota and U.S. manufacturers. U.S. respondents were more likely to participate in business-education collaborations than Minnesota respondents, and among those who did, participated in a larger variety of activities than Minnesota respondents. The 2007 DEED report had speculated that part of these differences could be explained by the exclusion of large Minnesota companies in the survey sample.

While the 2007 DEED survey did not include larger businesses, the 2011 DEED survey did. The 2011 results confirm the stark differences between Minnesota manufacturers and their national counterparts: Minnesota respondents have relatively much lower degrees of business-education collaboration and participate in a more limited variety of activities.

Similar shares of Minnesota manufacturers participated in business-education collaborations in 2011 (54 percent) as in 2007 (55 percent). Further, there were only slight increases between 2007 and 2011 in Minnesota respondents involved in activities such as conducting youth apprenticeships or internships (26 percent in 2007 vs. 30 percent in 2011), mentoring students (11 percent vs. 14 percent), and contributing space or equipment (10 percent vs. 12 percent). Thus, the inclusion of the larger Minnesota companies had only a slight impact on results related to business-education collaboration. See Figure 40 for more information.

Figure 41. Business-Education Collaboration, Minnesota vs. U.S. (2005)



Sources:

“Understanding the Worker Needs of Manufacturers: the 2011 Skills Gap Survey,” survey results, Minnesota Department of Employment and Economic Development, 2011.

“Understanding the Worker Needs of Manufacturers: the 2007 Skills Gap Survey,” survey results, Minnesota Department of Employment and Economic Development, 2007.

“2005 Skills Gap Report,” Deloitte, National Association of Manufacturers, and The Manufacturing Institute.

Conclusions

The 2011 Deloitte/MI study recommended that the manufacturing sector collaborate with public sector organizations, educational institutions, and industry associations to help narrow the talent shortage in the workforce. It is particularly important because workers in occupations facing the most severe shortages are those needing the most training. These collaborations can leverage limited resources to tailor workforce training to match business needs. Minnesota FastTRAC is one such collaboration of local, state and national partners. FastTRAC integrates basic skills education and career-specific training in high-demand fields that aligns with employers' workforce needs. The career pathways approach ensures workers acquire educational accreditation and workforce skills they know will be needed by businesses.

Further, the "People and Profitability" study in 2009 about people management practices in the manufacturing industry (by Deloitte, Oracle, NAM and MI) recommended that employers be creative with new approaches to human resource management, and promote employee engagement. The study found that the most profitable employers consistently assigned a higher importance to talent and human resource management practices. As a result, employers should implement people management practices to attract, retain and develop the skills of workers most critical to their future business success.

These recommendations are also applicable for this follow-up survey on the workforce needs of Minnesota's manufacturers. Other opportunities for improvement include:

- Employers should evaluate their current levels of investment in educating and training and compare them with the best practice (at least 3 percent of payroll).
- Employers should investigate the benefits of increased business-education collaborations.
- Manufacturers and the groups that advocate for them should consider policy changes for investments made in training and educating workers. That may vary by company size.
- Public and private placement service providers should improve their services, including those that are Internet-based, to more effectively serve Minnesota manufacturers.
- Educational and training institutions should study demand for skill and work-readiness certification, particularly on a regional basis. In Greater Minnesota, they should ensure students gain basic employability skills, as well as writing, reading and math skills.
- The State of Minnesota should capitalize on the increased awareness of its workforce and placement services, and continue to market its employer-related training services. Providers should assist businesses in using new and creative approaches for developing workforce skills to help resolve persistent shortages in some occupational groups, as well as challenges related to the aging workforce and employee retirements.

Overall, these survey results present both a significant challenge and a substantial opportunity for the State of Minnesota, local governments, the educational system and other service providers to align and prioritize services for supporting manufacturers. There are also opportunities for manufacturers to proactively build a workforce to sustain their business and ultimately, the manufacturing sector. Because results vary by geographic location and size of business, workforce development professionals should customize their approach for providing services to businesses. Services should be based on business needs and the businesses' willingness to be active partners in developing needed workforce skills.

Appendix I. Methodology

This survey was undertaken in April and May 2011 as a follow-up to the 2007 DEED skills gap survey, which in turn was modeled after the 2005 NAM survey. A few of the 2005 NAM/Deloitte/MI questions were also included in the repeated skills gap survey conducted by MI and Deloitte in 2011. The ability to compare the experiences of Minnesota businesses with national results was an important criterion. However, the DEED survey did not maintain rigid conformity with the NAM/Deloitte/MI and Deloitte/MI surveys. There were some modifications and omissions in the questions asked and the response options included, based on knowledge of Minnesota businesses.

Businesses were pulled from the Selectory Business Database by Dun and Bradstreet. Paper surveys were mailed to a stratified random sample of 2,400 manufacturing businesses in four size groups:

- A random sample of 734 businesses with 5 to 19 employees (very small);
- A random sample of 736 businesses with 20 to 74 employees (small);
- All 707 businesses with 75 to 250 employees (medium); and
- All 233 businesses with more than 250 employees (large).

Although the sample was not stratified by region, efforts were made to ensure representation across all sizes in all regions, as possible, in designing the survey pool.

A total of 511 businesses responded, for a response rate of 21.3 percent (and, 23.9 percent once adjustments for 191 non-deliverable addresses and non-useable responses are made). Overall, the survey has a confidence interval of +/- 4.1 percent, at a level of confidence of 95 percent.

Table 8. Summary of Respondent Characteristics, by Company Size (repeat)

Company Size	Number of respondents	Respondent Distribution	Original Distribution	Response Rates
Very Small (5-19)	110	22%	31%	15%
Small (20-74)	211	41%	31%	29%
Medium (75-249)	152	30%	29%	21%
Large (250 or more)	38	7%	9%	17%
All Respondents	511	100%	100%	21%

Table 9. Summary of Respondent Characteristics, by Minnesota Region

Region	Number of Respondents	Respondent Distribution	Original Distribution	Response Rates
Central	82	16%	14%	24%
Northeast	32	6%	5%	29%
Northwest	56	11%	9%	27%
Southeast	67	13%	11%	27%
Southwest	49	10%	8%	25%
Twin Cities	225	44%	54%	17%
All Respondents	511	100%	100%	21%